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TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1885.

No. 310. 66

STEWART HARTSHORN, APPELLANT,

vs.

THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, AND REUBEN KIMBALL.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF MICHIGAN.

FILED SEPTEMBER 29, 1883.

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1 By the Honorable Henry B. Brown, one of the judges of the circuit court of the United States for the eastern district of Michigan, in the sixth circuit.

To the Saginaw Barrel Company, A. W. Wright, A. A. Brockway, and Reuben Kimball:

Whereas Stewart Hartshorn has lately appealed to the Supreme
Court of the United States from a decree rendered by the circuit
court of the United for the eastern district of Michigan, in the sixth
circuit, made and entered on the 10th day of April, 1883, and by
which it was ordered, adjudged, and decreed that the bill of com-
plaint filed in said district by the said Stewart Hartshorn, complain-
ant, against you, the said Saginaw Barrel Company, A. W. Wright,
A. A. Brockway, and Reuben Kimball, defendants, for the alleged
violation and infringement of certain letters patent, No. 69189, dated
September 24, 1867, and reissued letters patent Nos. 7367 and 7370,
both dated October 31, 1876, and mentioned in the pleadings in said
suit be dismissed with costs, and from the order or decree founded
thereon, made and entered on the 18th day of May, 1883, by
2 which it was ordered, adjudged, and decreed that you, the
said defendants, recover of the said complainant the sum of
one hundred and eighty-five dollars and eight cents, as costs and
disbursements, and the said Stewart Hartshorn has filed the security
required by law upon his said appeal:

You are therefore cited to appear before the Supreme Court of the United States on the second Monday of October next and show cause, if any there be, why the decrees named in the aforesaid appeal should not be corrected and speedy justice should not be done to the parties in that behalf, and to do and receive what may appertain to justice to be done in the premises.

Given under my hand, at the city of Detroit, in the eastern district of Michigan, in the sixth circuit, the 25th day of June, in the year of our Lord one thousand eight hundred and eighty-three, and of the Independence of the United States the one hundred and seventh.

HENRY B. BROWN,
Dist. Judge.

Service of copy of above citation admitted.
Detroit, June 25th, 1883.

SPRAGUE & HUNT,
Solicitors for Saginaw Barrel Co., A. W. Wright,
A. A. Brockway, & Reuben Kimball.

2½ [Endorsed:] 2778. Stewart Hartshorn *vs.* The Saginaw Barrel Co., A. W. Wright, A. A. Brockway, and Reuben Kimball. Citation for complainant. Admission within. Filed in clerk's office June 25, 1883. Walter S. Harsha, clerk.

3 In the Circuit Court of the United States. In Equity.

To the honorable judges of the circuit court of the United States for the eastern district of Michigan:

Steward Hartshorn, a citizen of the State of New Jersey, brings this his bill of complaint against the Saginaw Barrel Company, located and doing business at Saginaw, State of Michigan; and A. W. Wright, A. A. Brockway, and Reuben Kimball, citizens of the State of Michigan, and residents and doing business at Saginaw, within the said eastern district of Michigan.

And thereupon your orator complains and says:

That on or before the 3d day of September, 1867, your orator was the first and original inventor and discoverer of certain new and useful improvements in shade fixtures, described in the letters patent hereinafter mentioned, and which had not been known or used by others prior to his invention and discovery thereof, and which had not been, at the time of his application for letters patent therefor, as hereinafter mentioned, in public use or on sale, with his consent and allowance, contrary, to the provisions of the acts of Congress of the United States in such case made and provided.

And your orator further shows unto your honors, on like information and belief, that the said your orator, being so as aforesaid the first and original inventor and discoverer of said improvements in shade fixtures, and being a citizen of the United States, and being desirous to obtain an exclusive property in said invention or improvement within and for the United States, did, on the 3d 4 day of September, 1867, upon due application therefor, and having in all things complied with the conditions and requirements of the acts of Congress in such case made and provided, obtain letters patent of the United States for said invention or improvements in due form of law, under the seal of the Patent Office, signed by the Secretary of the Interior, and countersigned by the Commissioner of Patents, bearing date the said 3d day of September, 1867, and being number 68502, by which said letters patent there was granted and secured, or intended to be granted and secured, to your orator, his heirs, administrators, or assigns, for the term of seventeen years from the said 3d day of September, 1867, the full and exclusive right and liberty of making, using, and vending to others to be used, the said invention or improvements described and set forth in said letters patent, which said letters patent are now remaining of record in the Patent Office of the United States, and as by reference to which will more fully and at large appear, and by virtue whereof the said your orator became and was the sole owner of all the rights and privileges granted and secured, or intended to be granted and secured, in and by said letters patent.

And your orator further shows unto your honors that your orator having, for good and lawful cause, after the issuing of the said letters patent as aforesaid, No. 68502, dated September 3d, 1867, surrendered the same to the Commissioner of Patents, and having made due application therefor, and having in all things complied with the conditions and requirements of the acts of Congress in such case

made and provided, did, on the 2d day of September, 1873, obtain new letters patent for the same invention upon an amended specification, for the residue of the term of seventeen years from the 3d day of September, 1867, which new letters patent were issued in due form of law, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior and countersigned
5 by the Commissioner of Patents, bearing date the said 2d day
of September, 1873, and being reissue number 5558, which said new and reissued letters patent are now remaining of record in the Patent Office of the United States.

And your orator further shows unto your honors that your orator having, for good and lawful cause, after the issuing of the said letters patent as aforesaid, reissue No. 5558, dated September 2, 1873, surrendered the same to the Commissioner of Patents, and having made due application therefor, and having in all things complied with the conditions and requirements of the acts of Congress in such case made and provided, did, on the 31st day of October, 1876, obtain new letters patent for the same invention, upon an amended specification, for the residue of the term of seventeen years from the 3d day of September, 1867, which new letters patent were issued in due form of law, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, bearing date the said 31st day of October, 1876, and being reissue number 7370, which said new and reissued letters patent are now remaining of record in the Patent Office of the United States, and as by said last-mentioned letters patent, or a duly authenticated copy thereof, ready in court to be produced if required, will fully and at large appear, and a copy of which is hereto annexed, marked A.

And your orator further complains and says:

That he is informed and believes that on or before the 24th day of September, 1867, William Campbell was the first and original inventor and discoverer of certain new and useful improvements in window shade fixtures, described in the letters patent hereinafter mentioned, and which had not been known or used by others prior to his invention and discovery thereof, and which had not been at at the time of his application for letters patent therefor, as
6 hereinafter mentioned, in public use or on sale, with his
consent and allowance, contrary to the provisions of the acts of Congress of the United States in such case made and provided.

And your orator further shows unto your honors, on like information and belief, that the said William Campbell, being so as aforesaid the first and original inventor and discoverer of said improvements in shade fixtures, and being a citizen of the United States, and being desirous to obtain an exclusive property in said invention or improvement within and for the United States, did, on the 24th day of September, 1867, upon due application therefor, and having in all things complied with the conditions and requirements of the acts of Congress in such case made and provided, obtain letters patent of the United States for said invention or improvements, in due form of law, under the seal of the Patent Office, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, bearing date the said 24th day of September, 1867, and being number 69176, by which said letters patent there was granted and secured, or intended to be granted and secured to the said William Campbell, his heirs, administrators, or assigns, for the term of seventeen years from the said 24th day of September, 1867, the full and exclusive right and liberty of making, using, and vending to others to be used the said invention or improvements described and set forth in said letters patent, which said letters patent are now remaining of record in the Patent Office of the United States, and as by reference to which will more fully and at large appear, and by virtue whereof the said William Campbell became and was the sole owner of all the rights and privileges granted and secured, or intended to be granted and secured, in and by the said letters patent.

And your orator further shows unto your honors that on or about
the 13th day of February, 1874, the said William Campbell
7 did, by an assignment in writing, duly signed, executed, and
delivered, and bearing date the said 13th day of February,
1874, sell and assign, and transfer unto your orator all his right, title and interest in and to said letters patent, so as aforesaid granted to him, said Campbell, and the invention described therein, and secured or intended to be secured thereby, which said assignment was recorded in the Patent Office of the United States on the 2d day of April, 1874, in liber U 17, page 392, as by said assignment, or a duly authenticated copy thereof, with the certificate of the recording thereof, ready in court to be produced if required, will more fully and at large appear, and by virtue whereof your orator became and was the sole and exclusive owner of all of the rights and privileges granted and secured, or intended to be granted and secured, in and by said letters patent granted so as aforesaid on the said 24th day of September, 1867.

And your orator further shows unto your honors that the said William Campbell, with the consent and for the benefit of your orator, having for good and lawful cause, after the issuing of the said letters patent as aforesaid, No. 69176, dated September 24, 1867, surrendered the same to the Commissioner of Patents, and having made due application therefor, and having in all things complied with the conditions and requirements of the acts of Congress in such case made and provided, did, on the 31st day of October, 1876, obtain new letters patent for the same invention, upon an amended specification, for the residue of the term of seventeen years from the 24th day of September, 1876, which new letters patent were issued in due form of law to your orator as assignee of said William Campbell, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, bearing date the said 31st day of October, 1876,
and being reissue number 7367, which said new and reissued
8 letters patent are now remaining of record in the Patent Office
of the United States and as by said last-mentioned letters
patent or a duly authenticated copy thereof, ready in court to be

produced if required, will fully and at large appear, and a copy of which is hereto annexed, marked B.

And your orator further shows unto your honors that by virtue of the premises he became and now is the sole owner of the rights and privileges granted and secured, or intended to be granted or secured, in and by the said letters patent reissues Nos. 7367 and 7370 before referred to, and each of them as above set forth, and is entitled to all damages occasioned by any infringements of said patents, and each of them, so as aforesaid granted, and the invention described therein.

And your orator further shows unto your honors that since he so became the owner and holder as aforesaid of the said rights and privileges under the said letters patent, your orator has put into practical use and operation the said invention or discovery, and has made and used and sold large numbers of shade fixtures made according to or containing and employing and using such inventions, and each of them, and has invested large sums of money, and been to great expense in and about such inventions, and for the purpose of putting the same into practical operation, and making the same profitable to your orator and useful to the public, and that such inventions have been and are of great advantage to your orator and to the public, and that the public have generally acknowledged and acquiesced in the aforesaid rights of your orator; and your orator believes he will realize and receive large gains and profits therefrom, if infringements by said defendant and his confederates shall be prevented.

And your orator further shows unto your honors that he has given sufficient notice, as required by the statute, to the public that the said fixtures so made and sold by him were patented by stamping or affixing thereon the notice required under the patent laws.

9 And your orator further shows unto your honors that on or about the 12th day of July, 1878, he filed his bills of complaint in the circuit court of the United States for the district of New Jersey, in the third circuit, against Melville A. Frazer, and also against Daniel Willis, and averred therein, among other things, the unlawful manufacture and sale by them, said Fraser and by said Willis, of shade fixtures, made in violation and infringement of the said reissued letters patent Nos. 7370 and 7367, and using and containing or employing the inventions described in and secured by the said letters patent Nos. 7370 and 7367, and praying for an injunction and account against the defendants in each of said suits, because of such unlawful manufacture and sale of such shade fixtures.

That said defendants, upon the filing of said bills against them, discontinued the manufacture and sale of the shade fixtures which they had heretofore made and sold, and which were alleged in said bills to be an infringement upon said patents Nos. 7370 and and 7367; and that afterwards, and on or about the 24th and 28th days of September, 1878, the said court, in each of said suits, entered a decree in favor of your orator, declaring that the said reissued letters patent Nos. 7370 and 7367 were good and valid patents, and that the defendants had infringed the same and the rights secured thereby, and ordered a perpetual injunction to issue against each of the said defendants to restrain them from manufacturing or selling shade fixtures constructed according to or employing or containing said improvements or inventions, and that they should account before a master for the profits which they had made by reason of the said manufacture and sale of shade fixtures, as by reference to the said decrees entered therein, in court to be produced, will more fully and at large appear.

And your orator further shows unto your honors that on or about the third day of May, 1880, he filed his bill of complaint in
10 the circuit court of the United States for the southern district
of New York, in the second circuit, against Charles Floss, alleging and charging therein the unlawful manufacture and sale by him (said Floss) of shade fixtures made in violation and infringement of the said reissued letters patent No. 7367, and praying for an injunction and account against the said defendant in said suit, because of such unlawful manufacture and sale of such shade fixtures.

That in said suit a motion was made before said court that a preliminary injunction issue against said defendant to restrain him, his agents, servants, and workmen, from making, using, or vending to be used shade rollers made in violation of said reissue No. 7367; that said defendant appeared on said motion, by counsel, and opposed the granting of said injunction; and that the said court, on the hearing of said motion, ordered a preliminary injunction to issue against said defendant, his agents, servants, and workmen, restraining him and them from making, using, or vending to be used shade rollers, employing or using in their construction the inventions or combinations described and claimed in the first and second claims in said reissue No. 7367.

And that afterwards, and on or about the 10th day of August, 1880, the said court ordered a decree to be entered in said suit in favor of your orator, declaring that the said reissued letters patent No. 7367 was a good and valid patent, and that the said defendant had infringed the same and the rights secured thereby, and ordered a perpetual injunction to issue against the said defendant, his agents, servants, and workmen, to restrain him and them from manufacturing or selling shade fixtures constructed according to, or employing or containing said improvements or inventions described and claimed in said reissued patents.

And further ordered that said defendant should account before a master for the profits which he had made or received, or which had
accrued to him from said infringement; and also that said
11 master should ascertain and report the damages your orator
had suffered and sustained by reason of said infringement over and above the gains and profits made by said defendant, as by reference to the said decree entered therein, in court to be produced, will more fully and at large appear.

And your orator further shows unto your honors, as he is informed and believes, that on or before the 24th day of September, 1867, Jacob

David, being the alleged first and original inventor of certain new and useful improvements in window-shade fixtures described in the letters patent hereinafter mentioned, and being a citizen of the United States, and being desirous to obtain an exclusive property in said invention or improvements within and for the United States, did, on the 24th day of September, 1867, upon due application therefor, and having in all things complied with the conditions and requirements of the acts of Congress in such case made and provided, obtain letters patent of the United States for said invention or improvements, in due form of law, under the seal of the Patent Office, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, bearing date the said 24th day of September, 1867, and being number 69189, by which said letters patent there was granted and secured to the said Jacob David, his heirs, administrators, or assigns, for the term of seventeen years from the said 24th day of September, 1867, the full and exclusive right and liberty of making, using, and vending to others to be used, the said invention or improvements described and set forth in said letters patent, which said letters patent are now remaining of record in the Patent Office of the United States, and as by reference to which will more fully and at large appear, and a copy of which is hereto annexed, marked C, and by virtue whereof the said Jacob David became and was the sole owner of all the rights and privileges granted and secured, or intended to be granted and secured, in and by the said letters patent.

12 And your orator further shows that on or about the 11th day of June, 1873, by mesne assignments in writing, duly executed and delivered, and recorded in the United States Patent Office, the said letters patent, so as aforesaid granted to said David, and the invention described therein and secured, or intended to be secured, thereby, was assigned and conveyed to the Salem Shade Roller Company, a corporation duly created by the laws of the State of Massachusetts, all which by said assignments, with the certificates of the recording thereof, or by certified copies thereof, ready to be produced, will more fully and at large appear.

And your orator further shows unto your honors that on or about the 17th day of September, 1873, the said Salem Shade Roller Company filed its bill of complaint in the circuit court of the United States for the district of Massachusetts, in the first circuit, against William G. Harris, and averred therein, among other things, the unlawful manufacture and sale by him of shade fixtures made in violation and infringement of the said letters patent No. 69189, and using and containing or employing the invention described in and secured by the said letters patent No. 69189, and praying for an injunction and account against said defendant.

That the said defendant filed his answer to the said bill of complaint, denying the validity of the aforesaid letters patent No. 69189, so issued to said David on the 24th day of September, 1867, and averring that said David was not the first and original inventor of the improvement or invention in shade fixtures described therein, but that the same had been known to and used by divers persons prior to any invention thereof by said David, and also denying that the said defendant had infringed the said letters patent.

That issue having been joined in the said suit, the parties proceeded to take proofs upon the issues therein, and that the said suit, upon the pleadings and proofs therein, came on for final hearing thereon before the judges of the said court, at the October
13 term, 1875, of said court, and was fully argued by the counsel of the respective parties; and that afterwards, and on or about the 17th day of February, 1876, the said court decided the said suit in favor of said Salem Shade Roller Company, holding that the said letters patent No. 69189 was a good and valid patent, and that said David was the first and original inventor of the improvement in shade fixtures described and claimed therein, and that the defendant had infringed the same, and ordered a perpetual injunction to issue against the said defendant to restrain him from manufacturing or selling shade fixtures employing or containing said improvement or invention, and that he should account before a master for the profits which he had made by reason of the said manufacture and sale of shade fixtures, as by reference to the said decision of said court and the decree entered therein, in court to be produced, will more fully and at large appear, and a copy of which decree is hereto annexed, marked D.

And your orator further shows unto your honors that on or about the 2d day of June, 1881, by mesne assignment, in writing, duly executed and delivered, and recorded in the Patent Office of the United States, the said letters patent, so as aforesaid granted to said Jacob David, and the invention described therein, and secured, or intended to be secured, thereby, was assigned and conveyed to your orator, all which by said assignment, with the certificate of the recording thereof, or by certified copies thereof, ready to be produced, will more fully and at large appear.

And your orator further shows unto your honors that by virtue of the premises he became, and now is, the legal owner and holder of the rights and privileges granted and secured, or intended to be granted or secured, in and by said letters patent No. 69189,
14 before referred to, and as above set forth, and is entitled to all damages occasioned by any infringement of said patent.

Yet the said defendants, well knowing the premises and the rights secured to your orator as aforesaid, but contriving to injure your said orator and to deprive your orator of the benefits and advantages which might and otherwise would accrue to him from said inventions, on the 1st day of January, 1881, after the issuing of the said letters patent, and at divers times before and since that time, and before the commencement of this suit, at Saginaw, and in the said district of Michigan, did, as your orator is informed and believes, and without the license or allowance, and against the will of your orator, and in violation of his rights, and in infringement of the aforesaid letters patent, unlawfully and wrongfully, and in defiance of the rights of your orator, make, construct, put in operation, use, and vend to others to use shade fixtures, and each of them made according to, or employing and containing and using said inventions or discoveries, or substantial or material parts thereof, described and patented in said letters patent reissues 7367 and 7370, and said patent 69189, and still continues so to do; and that they are threatening to make the aforesaid shade fixtures in large quantities and to supply the market therewith, and to sell the same, all in defiance of the rights acquired by and vested in and secured to your orator and to your orator's great and irreparable loss and injury, and by which your orator has been and still is being deprived of great gains and profits, which your orator might and otherwise would have obtained and received, but which have been received and enjoyed, and are being received and enjoyed, by the said defendants by and through their aforesaid unlawful acts and doings.

And your orator further shows unto your honors that the said defendants have derived and received, and are still deriving and receiving, from the aforesaid use of the said inventions large
15 gains and profits, but what amount of such gains and profits
have been so derived and received by said defendants your orator does not know and cannot set forth, but prays that said defendants may be required to make a discovery as to their use of said inventions, and of all gains and profits received by them therefrom or by means thereof.

And your orator further shows unto your honors that the aforesaid use of said inventions by the said defendants and their confederates, and their preparation and determination to continue the same and the aforesaid unlawful and wrongful acts, have the effect to encourage and induce other persons to infringe and defy the letters patent aforesaid, in disregard of the aforesaid rights and privileges of your orator.

And your orator further shows unto your honors that the said defendants have been warned and requested and notified to desist and refrain from said infringements and said unlawful and wrongful acts, but that such warning and request and notice has been wholly disregarded by said defendants, and that said defendants continue the infringements and unlawful and wrongful acts aforesaid.

And forasmuch as your orator can have no adequate relief except in this court, to the end, therefore, that the said defendants may, if they can, show why your orator should not have the relief hereby prayed, and may, upon their corporal oaths and according to their best and utmost knowledge, remembrance, information, and belief, full, true, direct, and perfect answers make to the premises, and to all the several matters hereinbefore stated and charged, as fully and particularly as if separately and severally interrogated as to each and every of said matters.

And your orator prays that the said defendants, The Saginaw Barrel Company, A. W. Wright, A. A. Brockway, and Reuben Kimball, their agents, attorneys, servants, and workmen, and each
16 and every of them, may be restrained and enjoined by the
order and injunction of this court from directly or indirectly making, constructing, using, vending, delivering, working, or putting into practice, operation, or use, or in any way counterfeiting or im-

itating, the said inventions or improvements, or any part thereof, described in said letters patent reissue 7367 and 7370, and in said patent No. 69189, or in either of them, in making, constructing, using, or vending any shade fixtures made in accordance with or containing or employing and using said inventions or improvements, and that said defendants may be decreed to pay the costs of this suit.

And that said defendants may be decreed to render an account for the shade-fixtures made or sold or used by them constructed according to or containing or employing and using the inventions or improvements described in said letters patent, or any of them, and to account for and pay over to your orator the profits by them acquired by the use of such machines, and also the damages suffered by your orator from the aforesaid unlawful acts; and your orator prays that this honorable court will assess such damages, or cause the same to be assessed under its direction, and will increase the same in accordance with the provisions of the patent laws of the United States in such case made and provided.

And that your orator may have such other or further order and relief as may be consistent with equity and good conscience.

May it please your honors to grant unto your orator the writ of injunction, as well preliminary and interlocutory as final and permanent, issuing out of and under the seal of this honorable court, commanding, enjoining, and restraining the said defendants, The Saginaw Barrel Company, A. W. Wright, A. A. Brockway, and Reuben Kimball, and their agents, attorneys, servants, and workmen, as is hereinbefore in that behalf prayed.

17 May it please your honors to grant unto your orator the writ of subpœna issuing out of and under the seal of this honorable court directed to the said defendants, The Saginaw Barrel Company, A. W. Wright, A. A. Brockway, and Reuben Kimball, commanding them by a certain day, and under a certain penalty therein expressed, to be and appear in this honorable court, then and there to answer the premises, and to stand to and abide by such order and decree as may be made against them.

And your orator will ever pray, &c.

STEWART HARTSHORN.

S. D. & J. T. LAW,
Complainant's Solicitors.
S. D. LAW,
Of Counsel for Complainant.

UNITED STATES OF AMERICA,
Southern District of New York, } *ss:*

Stewart Hartshorn, the complainant in the foregoing complaint named, being duly sworn, doth depose and say that he has read the foregoing bill of complaint by him subscribed, and knows the contents thereof, and that the same are true of his own knowledge, except as to those matters therein stated on information and belief, and as to those matters he believes it to be true.

And said Stewart Hartshorn further deposes and says that he believes that he is the first and original inventor of the invention and improvement patented to him in said patent No. 7370, and that he believes that said William Campbell was the first and original inventor and discoverer of the invention and improvement patented to him, reissured to your orator, No. 7367, as set forth in said bill of complaint.

And that the said patent No. 69189, granted to said Jacob David, Sept. 24, 1867, has been held by the circuit court of the United States, upon final hearing upon pleadings and proofs, to be a good
18 and valid patent, and that said David was the first and original inventor of the invention described and claimed therein, as set forth in the bill of complaint.

STEWART HARTSHORN.

Sworn to before me this 9th day of November, 1881.

S. NELSON WHITE,
Notary Public.

19 A.

UNITED STATES PATENT OFFICE.

STEWART HARTSHORN, of New York, N. Y.

Improvement in Curtain Fixtures.

Specification forming part of letters patent No. 68502, dated September 3, 1867; reissue No. 5558, dated September 2, 1873; reissue No. 7370, dated October 31, 1876; application filed May 27, 1875

To all whom it may concern:

Be it known that I, Stewart Hartshorn, of the city, county, and State of New York, have invented a new and improved shade-fixture; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and useful improvement in that class of shade-fixtures in which the shade-roller is provided with a spiral spring for automatically winding up the shade.

The present invention is an improvement on a shade-fixture of this class for which letters patent were granted to me, bearing date October 11, 1864, and reissued August 27, 1867, in which the pawl and ratched or notched hub designed and used to arrest the rotation of and hold the roller were arranged to act automatically and in such a manner that the shade could be stopped and retained at any desired position or point within the scope of its movement by simply manipulating the shade and varying the speed of the rotation of the roller and thereby dispensing with the use of side cords or counterpoises. As described and illustrated in such patent, the notched hub was attached to or made a part of the roller, while the pawl was fixed to one of the brackets which supported the rollers. In
20 such arrangement, also, of these parts, when the roller is removed from its brackets, the pawl and notched hub are

disconnected and the spring unwinds, which has again to be wound up previous to replacing the roller in its bearings.

In the present invention the pawl is hinged or pivoted as in the said patent referred to, but such pawl is placed on the end of the roller, or a part fixed thereto, and revolves with it, and the notched hub or ratchet is placed upon the spindle or stationary part of the fixture. Such arrangement of parts also permits the roller to be taken from its brackets without the spring unwinding.

In the accompanying sheet of drawings figure 1 is a longitudinal central section of a roller employing my invention, taken in the line *x x*, Fig. 2; Fig. 2, a transverse section of the same, taken in the line *y y*, Fig. 1; and Fig. 3 is an end view of such roller, showing the flattened end of the spindle and, in dotted lines, the position of the pawl and notched hub. Similar letters of reference indicate corresponding parts.

A represents a window-shade, and B the roller to which it is attached, the roller having a spiral or other spring, C, fitted within it and arranged in such a manner that it will have, when not restrained, a tendency to roll up the shade. The spring attachment as represented is the same as shown and described in my original letters patent. The roller B is provided with journals *a a'*, to one of which, *a*, sometimes called a "spindle," a hub, D, is keyed, said hub having a notch, *b*, made in it, as shown clearly in Fig. 2. The journal or spindle *a* of the roller is square, or has two flat sides at its outer end, as shown by dotted lines in Fig. 2, to fit into a bracket, E, attached to the window-frame, and this journal *a* does not turn with the roller, but the other journal, *a'*, is fitted firmly in a head, *c*, in the roller and turns with it, and to such head the case of the roller (a metallic tube, *d*) is attached, the journal or spindle
21 *a*, or an extension, a^{x}, thereof, being fitted loosely in the
head *c*, so that the roller may turn without the journal *a*, as will be fully understood by referring to Fig. 1. The end of the case or tube *d* of the roller has a disk, *e*, Figs. 2 and 3, secured in it, and this disk, as the roller B rotates, turns with it, and loosely on the fixed journal *a*. This disk *e* has a pawl or detent, F, attached to its inner side, as shown more particularly in Figs. 2 and 3, and such pawl or detent, when engaged with the notch *b* in hub D, retains or holds the roller B, so that it cannot turn under the influence of the spring C, and roll up the shade A. Such pawl or detent F is pivoted or hinged to the disk *e*, and acts substantially at right angles to the notched hub or spindle *a b*. The spring, when fitted in the case *d*, is attached at one end to the head *c*, and by the other end to the fixed journal or spindle *a*, or to its extension a^{x}, and the spring is wound up by pulling down the shade B; consequently, when the shade is fully down, the spring will have a tendency to wind it up. The pawl or detent F engages itself with, and disengages itself from, the notched hub D automatically.

In the construction shown in the drawing, in order to insure the pawl engaging with the hub, the motion of the shade is simply checked; for, by having the roller A and its disk *e* rotate slowly, the pawl will drop in the notch *b*; but when such roller and disk

are allowed to rotate rather quickly the pawl or detent will not drop into such notch, as its loose end will be carried, by the revolution of roller, toward the periphery, or away from the notched hub but, by changing or checking the revolution of the roller, the pawl will at once automatically drop into the notch and arrest the roller and shade. Hence the shade may be retained at any desired height without any difficulty whatever, as in the roller described in the
previous patent, by merely varying or changing, through the
22 simple manipulation of the shade, the speed of the rotation
of the roller, and the consequent movement of the shade.

The pawl or detent F is a hinged or pivoted pawl, as distinguished from a loose pawl moving in a chamber or guide of some form to keep it in position.

I do not claim, generally, the arrangement of both the pawl and ratchet upon or in connection with the roller, so that the roller can be removed from its brackets without permitting the spring to unwind, as I believe such an arrangement of pawl or detent and ratchet, as shown in the patent of William Campbell, granted to him September, 24, 1867, had been known previous to being made by myself.

What is claimed as new is—

In a spring shade-roller having a pawl or detent and ratchet, or their equivalent, constructed and arranged so as to engage automatically for holding the shade at any desired point or height, the combination, with a ratchet, or its equivalent, upon the stationary spindle or stationary part of the fixture, of a hinged or pivoted pawl, placed upon the end of the roller, and acting substantially at right angles to the ratchet or notched hub.

STEWART HARTSHORN.

Witnesses:
S. D. LAW.
A. S. GURLITZ.

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23 B.

UNITED STATES PATENT OFFICE.

WILLIAM CAMPBELL, of New York, N. Y., assignor to Stewart Hartshorn, of same place.

Improvement in Curtain Fixtures.

Specification forming part of letters patent No. 69176, dated September 24, 1867; reissue No. 7367, dated October 31, 1876; application filed May 27, 1875.

To all whom it may concern:

Be it known that I, William Campbell, of the city, county, and State of New York, have invented a new and useful improvement in window-shade fixtures; and I do hereby declare that the following is a full, clear, and concise description of the same, reference being had to the accompanying drawings, making a part of this specification.

This invention is an improvement in that class of shade fixtures in which the shade-roller is provided with a spiral spring for the purpose of automatically winding up the shade, and relates to an improved device or arrangement of parts by means of which such spring-roller and the shade attached thereto may be arrested and held stationary at any desired point or elevation within the range of its movement, and, at the same time, allow the shade to be drawn down or run up as far as may be desired without obstruction or stoppage, and by means of which also the tension of the spring will be preserved, or the spring be prevented from uncoiling when the roller is removed from the brackets, the same as when resting therein.

In such fixtures, as generally heretofore constructed, when the
shade-roller is removed from the brackets the spring in the
24 roller unwinds, which renders it necessary to again wind up
such spring before placing the roller in its brackets, and this
it is not easy for an ordinary or unskilled person to do; and it consists in the combination with a flattened or notched shaft or spindle of the roller, which acts as a ratchet, of loose or sliding pins or bolts acting as pawls or detents, and which, by their contact with such flattened or notched shaft or spindle, arrest and hold stationary the roller and its shade at any point desired, and in arranging such pins or detents on the roller having such a flattened or notched spindle, so that there will be no disconnection of the detent and ratchet when the roller is removed from its brackets, which prevents the spring unwinding.

Figure 1 is a front view of a roller, with shade attached, containing my improvement. Fig. 2 is a detail sectional view, enlarged, of the same through the line *x x*, Fig. 1. Fig. 3 is an enlarged view of one end of Fig. 2, a part being broken away to show the position of the operative parts.

A is the window-shade. B is the hollow roller, in one end of which is fixed a pivot or spindle, *a*, turning with the roller, and which rests and turns in the bracket C, and the other end of such roller revolves upon the shaft or spindle D, the projecting end of which does not turn with the roller, but is held or secured in the jaws of the bracket E. One end of the spiral spring, within the roller B, is secured to the spindle D, and the other end to the roller B, so that as the shade A is drawn down and the roller revolved the spring will be wound up or closer around the shaft D, and thus have, when not restrained, a tendency to roll up the shade.

In the block or cap part *b* that forms the end of the roller B, and forms its bearing upon the shaft or spindle D, and about which it revolves, are two holes or cavities, 1 1, upon opposite sides, extending from its outer surface to the shaft or spindle D, as shown in Fig. 2, the outer ends of which cavities may be countersunk, as shown.

25 The opposite sides of the shaft or spindle D, within the block or cap part *b* of the roller, are flattened or notched, as shown in Fig. 2, to take the pins or bolts moving in the cavities 1. F F are two pins or bolts or detents, the bodies of which fit loosely in the holes 1 1 in the block or cap *b*, and the heads of which fit loosely in the countersunk parts of such holes, the length of such

bolts or detents being such that, when their heads are against the case or shell *c* of the roller, their points or lower ends will be free from, or not be in contact with, the shaft or spindle D; but when such bolts drops, so that their heads rest upon the bottom of the countersunk part of such holes, their points or lower ends will be in contact with the flattened or notched sides of the spindle or shaft D, so as to bind against such spindle and prevent the revolution of the roller. Whenever the shade A is drawn down, or is allowed to run up with a quick movement, the centrifugal force, produced by the revolution of the roller B, projects the pins outward, so that they are carried away from the spindle D and against the case or shell *c* of the roller, thus permitting the roller to revolve freely upon the shaft or spindle D; but when the shade and the revolution of the roller is checked the bolt or detent F, which happens to be uppermost, drops down upon and against the flattened or notched side of the spindle D and arrests the further revolution of the roller and holds it securely in place.

As these pins or detents are placed in a recess upon the roller, of which the spindle which forms the ratchet is also a part, they are equally effective to hold the roller from turning, whether the roller remains in or is removed from the brackets, and, therefore, the spring is prevented unwinding when the roller is taken out of its brackets.

The pins or detents F F are loose or sliding, as contradistinguished
from such as are hinged or pivoted, and are kept in position
26 so as to engage with the ratchet or notched spindle by the
chamber or guide in which they move.

What is claimed as new is—

1. In a spring shade-holder, having a pawl or detent and a ratchet, or their equivalent, so arranged as to allow the shade to be drawn down or run up without obstruction, and which engage automatically with each other to hold the shade in any desired position, the arrangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that when the roller is removed from its brackets the tension of the spring will be preserved.

2. In a spring shade-roller, having a detent and ratchet, or their equivalent, constructed and arranged to engage automatically with each other for holding the shade, the combination, with the ratchet, or its equivalent, of a loose pawl or detent, moving in a chamber or guide, and adapted to engage with the spindle.

3. The combination of the loose or sliding pins or detents F, constructed as described, with the flattened or notched shaft or spindle, substantially as herein shown and described.

WILLIAM CAMPBELL.

Witnesses:

S. D. LAW.
HUGH JONES.

27

C.

UNITED STATES PATENT OFFICE.

JACOB DAVID, of New York, N. Y.

Improved Curtain Fixture.

Specification forming part of letters patent No. 69189, dated September 24, 1867.

To all whom it may concern:

Be it known that I, Jacob David, of New York city, 20 Ann street, in the county and State of New York, did invent a new and useful improvement in shade fixtures, and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 is a longitudinal section of a shade-roller made according to my invention. Fig. 2 is an elevation of the journal-box *f*, which performs the double office of supporting one end of the roller and of stopping its revolution when desired, and thereby preventing the winding up of the curtain.

Similar letters indicate corresponding parts.

This invention consists in a novel construction of shade fixtures, in which I arrange the spring that winds up the shade, and the detent that arrests the action of said spring in the same end of the roller, whereby I am enabled to combine a spring and detent with a common solid wooden roller, a socket for the spring being bored out in one end of the roller, and the other end being left in its natural condition so that it can be fitted to a window by sawing off any excess in length in the same manner as plain wooden rollers without automatic spring fixtures are now shortened and fitted.

My invention is applicable to shade-rollers of any material.

28 The letter *a* designates a wooden shade-roller. A cavity or socket, *b*, is bored out in one end to receive the spring *c* and the rod *d*, to which said spring is attached. The outer end rod *d* extends through the protecting place which covers the perforated end of the roller, and said outer end of the rod is squared or flattened to enable it to fit a slot of corresponding form made in the journal-box *f*, by which means the rod *d* is prevented from turning with the roller. The spring *c* is wound around the rod, one end of the spring being fastened to said rod near its outer end, and the other end of the spring being fixed to a block or cross-head, *g*, which is loose upon the rod, but which is prevented from turning by a pin, *h*, which extends from the periphery of the cross-head and enters a slot, *i*, which intersects the socket or hollow of the roller near its inner end. The slot is made long enough to allow for the sliding of the cross-head *g* along the rod to and fro as the spring is alternately shortened and lengthened on being wound and unwound upon said rod, the pin *h* moving to and fro in the slot, and preventing the cross-head from turning on the rod.

The slot in journal-box *f*, which receives the end of rod *d*, is open at its right-hand side, near the top, to let the rod enter and be removed at pleasure, the opening being so arranged and formed that one part, *j*, the left-hand side in Fig. 2, is higher than the right-hand side, and is vertical, so that it will stop the winding up of the shade by arresting the roller through the action of the arm or detent *k*, which is hinged in a radial slot in the same end of the roller which contains the spring, said detent being arranged in the plane of the axis of the roller, its free end working through a radial slot in the protecting plate *e*, so that the movement of the end of the arm or detent is toward and away from the axis of the roller, centrifugal action (when the roller is rapidly turned) sending the detent outward, at which times it will pass over the elevated side *j* of the journal-box *f*. When the roller is moving slowly, or is in a
29 state of rest, the action of gravity brings the detent toward
the centre of the roller at these times, when the detent is above the centre, and at such times said detent engages the said part *j*, and the revolution of the roller is arrested.

The height of the part *j* of the journal-box is such as to allow the arm *k* to fall against it when it is near the centre of the roller, which position it occupies whenever the roller in turning brings the arm above the axis, unless when turning at a high speed, in which case centrifugal action carries the arm far enough away from the axis or centre of the roller to allow it —pass over the side *j* of the box. The outside of the part *j* is rounded off, so that the arm *k* will ride over it with ease when the roller is being turned against its spring, as when unwinding the shade.

The solid end of the roller, after the roller has been sawed off and fitted to the place it is to occupy in a window, is fitted with the usual plate *l*, from the centre of which projects a journal that is received in a journal-box, *m*, which is screwed to the window casing.

My invention enables me to make use of wooden rollers in shade fixtures, which wind or draw up their shades automatically, and thereby to cheapen and simply them, both in construction and in fitting them for use at windows, one end of the rollers being still left unoccupied and free to be cut off when it becomes necessary to shorten it on fitting the same to a window.

As a consequence of my invention it follows that the roller can be made complete in the factory and left of full length, so that it can be fitted by the upholsterer to a window merely by removing its surplus length.

All other automatic or spring rollers are made of metallic tubes of different lengths, which cannot be shortened without destroying or injuring the roller.

What I claim as new, and desire to secure by letters patent, is—

30 1. The arm or detent *k*, arranged upon the roller in such a manner that it moves toward and away from the centre or axis of the roller *a* by the action of gravity and centrifugal force, substantially as described.

2. The combination and arrangement at the same end of a shade-roller, of the spring *c*, rod *d*, and arm of detent *k*, or their mechanical equivalents, substantially as described.

This specification signed by me this 27th day of July, 1867.

JACOB DAVID.

Witnesses:

W: HAUFF.
GUSTAV BERG.

31 D.

Decree.

U. S. Circuit Court, District of Massachusetts.

SALEM SHADE ROLLER MANUF. CO. *vs.* WILLIAM G. HARRIS.

DEC. 22, 1875.

Upon consideration of the pleadings and proofs, and after having heard the parties fully, by their respective counsel, it is ordered, adjudged, and decreed as follows:

First. That letters patent number 69189, granted to Jacob David September 24th, 1867, is a good and valid patent, and that the said Jacob David is the original and first inventor of the invention therein described and claimed.

Second. That the complainants are assignees and owners of said letters patent.

Third. That the defendant has infringed the first claim of said letters patent by the sale of curtain fixtures, in which the pawl or detent is moved away from the axis of the roller by centrifugal force and towards that axis by gravity, and has infringed the second claim of said patent by the sale of curtain fixtures, the rollers of which are of wood, with a chamber formed in one end, and containing the spring for actuating the roller and its rod, the rollers having also a detent, this spring, its rod, and the detent being so arranged as to admit of shortening the roller to fit the window by simply sawing off a portion of it.

Fourth. That the complainant recover of the defendant all gains and profits derived by him from his said use of said inventions respectively, and also, in addition thereto, the damages sustained by the complainant by reason of such use by the defendant, and also the costs of suit to be taxed. 32

Fifth. That this suit be referred to John G. Stetson, Esq., master in chancery, to ascertain and report to the court the gains and profits and to assess the damages above mentioned; and that the complainant is authorized to examine the defendant *ore tenus* or otherwise, and to inspect all books and other vouchers in the premises.

Sixth. That the defendant, his servants, agents, workmen, and attorneys, be enjoined perpetually from making, using, or selling any one or more curtain fixtures in which the pawl or detent is moved away from the axis of the roller by centrifugal force and towards that axis by gravity, and also any one or more curtain fixtures, the rollers of which are of wood, having a chamber formed in one end and containing a spring for actuating the roller and the rod of the spring and having a detent, and in which this spring, its rod, and the detent are so arranged as to admit of shortening the roller to fit the window by simply sawing off a portion of it.

By the court:

JOHN G. STETSON, *Clerk.*

A true copy of the decree entered in the above-entitled cause on the 22d day of December, A. D. 1875.

Attest:

[SEAL.] ALEX. H. TROWBRIDGE,
Deputy Clerk of said Court.

33 Circuit Court of the United States of America for the Sixth Circuit and Eastern District of Michigan. Sitting in Chancery.

The President of the United States of America to the Saginaw Barrel Company, located and doing business at Saginaw, State of Michigan, A. W. Wright, Saratoga, A. A. Brockway, and Reuben Kimball, all of Saginaw, Michigan, who are citizens of the State and residents of the eastern district of Michigan:

[SUBPŒNA SEAL.]

You are hereby commanded to be and appear in the circuit court of the United States of America for the sixth circuit and eastern district of Michigan, sitting in chancery, before the judges thereof, at the district court-room, in the city of Detroit, on the first Monday of December next ensuing, then and there to answer unto a bill of complaint exhibited against you, as defendants, by Stewart Hartshorn, of the State of New Jersey, who is a citizen of the State of New Jersey, as complainant. And this you shall in no wise omit, under the penalty of one thousand dollars.

Witness the Hon. Morrison R. Waite, Chief Justice of the Supreme Court of the United States, this eleventh day of November, in the year of our Lord one thousand eight hundred and eighty-one, and of the Independence of the United States the one hundred and sixth.

ADDISON MANDEL, *Clerk.*

Memorandum.

The above-named defendants are required to enter their appearance in this suit with the clerk of this court, at his office, in the city of Detroit, on or before the day on which this writ of subpœna is returnable; otherwise the bill of complaint in this cause will be taken *pro confesso* against said defendant.

ADDISON MANDELL, *Clerk.*

EASTERN DISTRICT OF MICHIGAN, *ss:*

I hereby certify and return that on the 23rd day of November, A. D. 1881, I served the within writ on Reuben Kimball, one of the defendants within named, at Saginaw, in said district, by delivering to him personally a true copy thereof, also exhibiting this writ, with the seal of the court impressed thereon; on the Saginaw Barrel Company, one of the defendants within named, at Saginaw, in said district, by delivering to Reuben Kimball, secretary and treasurer of the said Saginaw Barrel Company, a true copy thereof for said company, and on A. A. Brockway, one of the defendants named in said writ, by leaving a true copy thereof at his dwelling-house, or usual place of abode in Saginaw, with Miss King, an adult person, a member of and resident in his family, said copies having like memorandum appended thereto as is hereto appended.

I further return that A. W. Wright cannot be found in my bailiwick.

S. S. MATHEWS,
U. S. Marshal.

Fees;

3 services	6 00
3 copies	1 50
115 miles' travel	6 30
	$13 80

Endorsed: No. 2778. Circuit court of the United States for the sixth circuit and eastern district of Michigan. In chancery. Stewart Hartshorn, compl't, *vs.* The Saginaw Barrel Company *et al.*, def't-. Subpœna. Filed in clerk's office Nov. 25th, 1881. A. Mandell, clerk.

34 United States Circuit Court, East. Dist. of Michigan. In Equity.

STEWART HARTSHORN *vs.* THE SAGINAW BARREL CO. *et al.*

Please take notice of our retainer, and enter our appearance for the defendants in the above-entitled cause and demand for copy of the bill of complaint.

SPRAGUE & HUNT,
Solicitors, Detroit, Michigan.

To the clerk of the aforesaid court.

Endorsed: 2778. Circuit court E. D. of Mich. In equity. Stewart Hartshorn *vs.* The Saginaw Barrel Co. *et al.* Precipe for appearance filed in clerk's office Dec. 1, 1881. A. Mandell, clerk.

35 In the United States Circuit Court for the Eastern District of Michigan. In Equity.

STEWART HARTSHORN

vs.

THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, and REUBEN KIMBALL.

The answer of the said defendants, The Saginaw Barrel Company, A. W. Wright, A. A. Brockway, and Reuben Kimball, to the bill of complaint of Stewart Hartshorn, complainant.

The defendants, now and at all times hereafter saving and reserving to themselves all and all manner of benefit and advantage 36 of exception to the many errors and insufficiencies in the complainant's said bill of complaint contained, for answer thereunto, or unto so much or such parts thereof as the defendants are advised is material for them to answer, answering, say:

I. That they have no knowledge or information, save as derived from said bill of complaint, regarding the alleged invention of the said complainant of certain new and useful improvements in shade fixtures, or of his application for letters patent therefor, or that any letters patent were issued to the said complainant for the said improvements in shade fixtures, and they therefore leave the complainant herein to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court shall direct.

II. And these ddfendants, further answering, say that they have no knowledge or information, except as derived from said bill of complaint, that the aforesaid letters patent were inoperative and invalid by reason of a deficient or insufficient specification; or that any error had arisen therein by inadvertence, accident, or mistake, and without any fraudulent or deceptive intention; or that for any good and lawful cause said letters patent were surrendered and reissued as alleged in said bill of complaint, and therefore they leave said complainant to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court shall direct.

III. And these defendants, further answering, deny that said letters patent No. 68502 were inoperative or invalid, or that the same contained any errors that had arisen by inadvertence, accident, or mistake, or that the said reissued letters patent No. 5558 is for the same invention as that described and claimed in the aforesaid letters, and allege the fact to be that said reissued letters 37 patent are inoperative and invalid, by reason of containing new matter not contained or claimed in the aforesaid letters patent.

IV. And these defendants, further answering, say that they have no knowledge or information, save as derived from said bill of complaint, that the aforesaid reissued letters were inoperative and invalid by reason of a deficient or insufficient specification, or that the same contained any errors which had arisen through inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, or that for any good and lawful cause said reissued letters patent were surrendered and reissued, as alleged in said bill of complaint, and therefore they leave said complainant to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court may direct.

V. And these defendants, further answering, deny that said reissued letters patent No. 5558 were surrendered for any good and lawful cause, or that the same contained any errors which had arisen by reason of inadvertence, accident, or mistake, or that the said reissued letters patent No. 7370 was for the same invention as that described and claimed in the first hereinbefore-mentioned letters patent, and they allege the fact to be that the said reissued letters patent No. 7370 are inoperative and invalid by reason of containing new matter not contained or claimed in the first hereinmentioned letters patent.

VI. And these defendants, further answering, say that they have
no knowledge or information, save as derived from said bill of com-
plaint, regarding the alleged invention of William Campbell for
certain new and useful improvements in window-shade fixtures, or
of his application for letters patent therefor, or that any
38 letters patent were issued to the said William Campbell for
the said invention, to wit, on the 24th day of September,
1867, and hence they leave the aforesaid complainant to make such
proof thereof as he may be advised is necessary in the premises, or
as this honorable court shall direct.

VII. And these defendants, further answering, say they have no knowledge or information, save as derived from said bill of complaint, relative to any assignment by the said William Campbell to the said complainant on the 13th day of February, 1874, or at any other time, of the said letters patent No. 69176, or that said assignment was recorded in the Patent Office of the United States, and hence they deny the same, and leave the said complainant to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court may direct.

VIII. And these defendants, further answering, say that they have no knowledge or information, save as derived from said bill of complaint, that the said letters patent No. 69176 (being the letters patent to the said William Campbell, dated September 24, 1867) were inoperative and invalid, or that the same contained errors which had arisen through inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, or that the said William Campbell, with the consent and for the benefit of the aforesaid complainant, and for any good and lawful cause, surrendered said letters patent No. 69176 for a reissue thereof, or that any reissued letters patent were issued to said complainant, as assignee of the said William Campbell, and numbered 7367, and hence they deny the same and leave said complainant to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court shall direct.

39 IX. And these defendants, further answering, deny that the
letters patent No. 69176 were inoperative and invalid by
reason of a deficient or insufficient specification, or that any error

had arisen therein through inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, or that for any good and lawful cause said letters patent No. 69176 were surrendered and reissued, as alleged in said bill of complaint, or that the said reissued letters patent No. 7367 are for the same invention as was described and claimed in said letters patent No. 69176; and they allege that said reissued letters patent No. 7367 are invalid, as containing new matter not described and claimed in said letters patent No. 69176.

X. And these defendants, further answering, allege the fact to be that the several reissued letters patent hereinbefore named, to wit, Nos. 5558, 7367, and 7370, were fraudulently obtained, with the intention to deceive the public, and of depriving subsequent inventors and patentees of their rights by enlarging the scope of the claims of the said several reissues to embrace inventions not known to the inventors of the inventions described in the said original letters patent Nos. 68502 and 69176 at the date of the original applications for said last-named letters patent.

XI. And these defendants, further answering, deny, on information and belief, that said complainant is the owner of any rights covered, or intended to be covered, by the said reissued letters patent No. 7367 and 7370, and, therefore, they leave said complainant to his proofs thereof as he may be advised is necessary for him to make.

XII. And these defendants, further answering, deny, on information and belief, that on or about the 12th day of July, 1878,
40 said complainant filed his bill of complaint in the circuit court of the United States for the third circuit for the district of New Jersey against Melville A. Fraser and Daniel Willis for infringement of the aforesaid reissued letters patent Nos. 7370 and 7367, or that a decree was entered in said court in said cause declaring that said reissued letters patent Nos. 7370 and 7367 were good and valid patents and infringed by the said Melville A. Fraser and Daniel Willis, and ordering a perpetual injunction against each of said defendants, and that they should account before a master for the profits they had made by reason of said alleged infringement; and these defendants allege, and charge the fact to be, that the said cause was not heard by the said court upon pleadings and proofs and arguments by counsel, but that said decree was entered by default or by consent of the said defendants, Melville A. Fraser and Daniel Willis, and that the said court was deceived by the collusive acts of the said complainant and the said defendants, Melville A. Fraser and Daniel Willis.

XIII. And these defendants, further answering, say that they have no knowledge or information, save as derived from said bill of complaint, that said complainant, on or about the 3rd day of May, 1880, filed his bill of complaint in the circuit court of the United States for the southern district of New York against Charles Floss for an alleged infringement of said reissued letters patent No. 7367, or that a preliminary injunction was issued against said defendant Floss, or that on or about the 10th day of August, 1880, a decree was entered in said court in said cause declaring said letters patent No. 7367 was a good and valid patent, and ordering a perpetual injunction to

issue against the said defendant Floss, and that he should
41 account before a master for the gains and profits he, said defendant Floss, had made by reason of said alleged infringements; and these defendants further allege, and charge the fact to be, that said cause was not heard upon pleadings and proofs, and argument by counsel, but that said decree was entered by default or by consent of said defendant Floss, and that said court was deceived by the collusive acts of the complainant and the said defendant Floss.

XIV. And these defendants, further answering, say that they have no knowledge or information, save as derived from said bill of complaint, regarding the alleged invention of Jacob David, of certain new and useful improvements in window-shade fixtures, or that the said Jacob David applied for and obtained letters patent for said invention on the 24th day of September, 1867, No. 69189, and hence they deny the same, and leave the complainant to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court shall direct.

XV. And these defendants, further answering, say they have no knowledge or information regarding any assignment by means of which said Salem Shade Roller Company became seized of the rights conveyed by said last-mentioned letters patent, and hence they deny the same, and leave said complainant to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court shall direct.

XVI. And these defendants, further answering, say they have no information or knowledge, save as derived from said bill of complaint, that said Salem Shade Roller Company filed its bill of complaint on or about the 17th day of September, 1873, in the circuit court of the United States for the district of Massachusetts against William G. Harris for an alleged infringement of said patent No. 68189,
42 or that issue was joined in said cause; or that said cause was heard by said court, upon pleadings and proofs and arguments by counsel; or that said court decreed that said patent No. 69189 was a good and valid patent, and infringed by the said defendant, Harris; or that an injunction was ordered to issue against the said defendant, or that he should account before a master for the profits said defendant had made by reason of said infringement; and hence these defendants deny the same, and leave the complainant to his proof as he may be advised is necessary in the premises, or as this honorable court shall direct.

XVII. And these defendants, further answering, say, on information and belief, that said decree was obtained by fraud and collusion between the parties, complainant and defendant, and that a fraud was perpetrated on the said court by means of which a decree was entered for infringement of an invention not claimed and described in said letters patent No. 69189.

XVIII. And these defendants, further answering, say that they have no knowledge or information, save as derived from said bill of complaint, regarding the use of said letters patent to the great or any gain on the part of said complainant, or that he has invested large or any sums of money in the manufacture and sale of the inventions claimed and described in the aforesaid letters patent, or that his gains and profits have been affected by the acts of these defendants; or that these defendants have had any notice of the alleged rights of the said complainant in the premises, and these defendants, on information and belief, deny the same, and leave the said complainant to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court shall direct.

43 XIX. And these defendants, further answering, say that they have no knowledge or information, save as derived from said bill of complaint, relative to any assignments, whereby said complainant became seized of the rights conveyed, or intended to be conveyed, by said letters patent No. 69189, and hence they deny the same, and leave said complainant to make such proof thereof as he may be advised is necessary in the premises, or as this honorable court shall direct.

XX. And these defendants, further answering, deny that they have ever made, used, or vended any window-shade fixtures embodying the alleged patented inventions of the said Steward Hartshorn, or William Campbell, or Jacob David, as described in the aforesaid letters patent, or either of them, as alleged in said bill of complaint.

XXI. And these defendants, further answering, say, upon information and belief, the said complainant was the first and original discoverer of the invention described in the aforesaid letters patent No. 7370; and that the said William Campbell was the first and original inventor of the invention described in aforesaid letters patent No. 7367; and that the said Jacob Davis was the first and original inventor of the invention described in the aforesaid letters patent No. 69189; but, on the contrary, they allege, on information and belief, that the said several inventions, or material or substantial parts thereof, were shown and described in the following letters patent of the United States, to wit:

a. As to the aforesaid letters patent No. 7370, in letters patent to—

Stewart Hartshorn, dated November 11, 1864, No 44624;
44 To L. A. Tripp, dated August 6, 1867, No. 67465;
To S. S. Putnam, dated September 2, 1862, No. 36366;
To L. A. Tripp, dated February 19, 1867, No. 62235;

Also in English patents, No. 12375 of 1848, and No. 1944 of 1853, and No. 2418 of 1854.

b. As to the aforesaid letters patent No. 7367, in letters patent to—

Stewart Hartshorn, dated November 11, 1864, No. 44624;
Also to Stewart Hartshorn, dated September 3, 1867, No. 68502;
Also to Stewart Hartshorn, dated August 27, 1867, No. 2756;
Also to L. A. Tripp, dated August 6, 1867, No. 67465;
To S. S. Putnam, dated September 2, 1862, No. 36366;
To L. A. Tripp, dated February 19, 1867, No. 62235;

Also in English patents No. 12375 of 1848, No. 1944 of 1853, and No. 2418 of 1854.

c. As to the aforesaid letters patent No. 69189, in the above-named letters patent; also in letters patent to—

William Campbell, September 24, 1867, No. 69176;
Also to L. A. Tripp, dated August 6, 1867, No. 67465;
To S. S. Putnam, dated September 2, 1862, No. 36366;
To L. A. Tripp, dated February 19, 1867, No. 62235;

Also in English patents No. 12375 of 1848, No. 1944 of 1853, and No. 2418 of 1854.

45 XXII. And these defendants, for further matter of defense, say that they are engaged in manufacturing and selling curtain roller fixtures, made in accordance with the specification and drawings of certain letters patent issued to W. B. Noyes and dated and numbered, respectively, September 24, 1878, No. 208,417; March 23, 1880, No. 225,857; and December 20, 1881, No. 251,275, under the authority of the said Noyes, and that such manufacture and sale, as these defendants are informed and verily believe, is in no sense an infringement of any rights of said complainant conveyed or secured to him, intended to be conveyed or secured to him, by the three several aforesaid letters patent, for infringement of which said bill of complaint was filed.

XXIII. And these defendants deny, on information and belief, that they have injured or are now injuring said complainant, or that they have violated or are now violating any exclusive rights of said complainant in his said bill of complaint.

XXIV. And these defendants deny that the said complainant is entitled to any relief of any kind in the premises.

XXV. And these defendants pray hence to be dismisssed, with their reasonable costs and charges in this behalf most wrongfully sustained.

SAGINAW BARREL CO.,
By REUBEN KIMBALL,
Secretary.

SPRAGUE & HUNT,
Defendants' Solicitors and of Counsel.

46 UNITED STATES OF AMERICA, } *ss:*
Eastern District of Michigan, }

DETROIT, MICHIGAN.

Reuben Kimball being duly sworn by me, a notary public in and for the county of Wayne, in said district, deposes and says that he is secretary of the Saginaw Barrel Company and one of the above-named defendants, and that he signed the foregoing answer; that he has read the contents thereof, and knows the same to be true, except as to those matters stated therein to be on information and belief, and as to those matters he beleives them to be true.

REUBEN KIMBALL.

Sworn and subscribed before me this 27th day of December, 1881.

ADOLPH BARTHEL,
Notary Public, Wayne County, Michigan.

The Circuit Court of the United States for the Eastern District of Michigan. In Equity.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY *et al.*

The said defendants hereby amend their answer by striking out of section *a* of paragraph XX the words and figures following, viz: "No. 2418 of 1854," and by inserting in place thereof the words and figures following, viz: "No. 2416 of 1854."

47 And also by striking out of section *b* of said paragraph XX the words and figures following, viz: "No. 2418 of 1854," and inserting in place thereof the words and figures following, viz: "No. 2416 of 1854."

And also by striking out of section *c* of said paragraph XX the words and figures following, viz: "No. 2418 of 1854," and inserting in place thereof the words and figures following, viz: "No. 2416 of 1854."

SPRAGUE & HUNT,
Solicitors for Defendants and of Counsel.

The Circuit Court of the United States for the Eastern District of Michigan. In Equity.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, and REUBEN KIMBALL.

It is hereby stipulated and agreed that the time for taking testimony in the above-entitled cause shall be extended until October 1, 1882.

May 4, 1882.

S. D. & J. T. LAW,
Solicitors for Complainant.

SPRAGUE & HUNT,
Solicitors for Defendants.

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48 The Circuit Court of the United States for the Eastern District of Michigan. In Equity.

STEWART HARSTHORN, Complainant,
vs.
SAGINAW BARREL COMPANY *et al.*, Defendants.

Take notice that in the above-entitled cause, on Wednesday, the 28th day of June, 1882, at 11 o'clock in the forenoon, before Henry S. Sprague, Esq., a notary public (or some other person authorized to take depositions in like cause), at his office, No. 37 Congress street, west, in the city of Detroit, in the State of Michigan, we shall take the deposition of witnesses on behalf of the above-named defendant, to be read at the final hearing in this cause.

Respectfully, SPRAGUE & HUNT,
Sol's for Defendant.

To Messrs. S. D. & J. T. Law, solicitors for complainant, corner Beekman and Nassau streets, New York.

Timely notice of this notice received, and service hereof acknowledged.

New York, June 19, 1882.

S. D. & J. T. LAW,
Complainant's Solicitors.

49 United States Circuit Court, Eastern District of Michigan.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY and Others.

This replicant, saving and reserving to himself now and at all times hereafter all and all manner of benefit and advantage of exception which may be had or taken to the manifold insufficiences of the said answer of the said defendants, for replication thereunto says that he will aver, maintain, and prove his bill of complaint to be true, certain, and sufficient in the law to be answered unto; and that the said answer of the said defendants is uncertain, untrue, and insufficient to be replied unto by this replicant without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, and not herein and hereby well and sufficiently replied unto, confessed and avoided, traversed or denied, is true, all which matters and things this replicant is and will be ready to aver, maintain, and prove as this honorable court shall direct, and humbly prays as in and by his said bill he has already prayed.

S. D. & J. T. LAW,
Sol's for Comp't.

Endorsed: 2778. U. S. circuit court, east. dist. Mich. S. Hartshorn *vs.* Saginaw Barrel Company and others. Replication. S. D. & J. T. Law, compl't's sol'rs. Filed in clerk's office Jan'y 23rd, 1882. A. Mandell, clerk.

50 The Circuit Court of the United States for the Eastern District of Michigan. In Equity.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY *et al.*

It is hereby stipulated and agreed that the said defendants may amend their answer in the above-entitled cause by striking out of sections *a*, *b*, and *c*, of paragraph XX the words and figures following, viz: "No. 2418 of 1854," and inserting in place thereof the letters and figures, viz: "No. 2416 of 1854."

Dated May 15, 1882.

S. D. & J. T. LAW,
Sol's for Compl't.

Endorsed: 2778. The circuit court of the United States for the eastern district of Michigan. In equity. Stewart Hartshorn *vs.* The Saginaw Barrel Company *et al.* Stipulation for amending answer rec'd and filed May 17th, 1882. Jno. Graves, dep. clerk.

Action. Infringements of Patent.

U. S. Cir. Court, East Dist. Mich.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL Co. and Others.

Issue joined Jan'y, 1882.

S. D. & J. T. LAW,
Sol'rs for Compl't.
SPRAGUE & HUNT,
Sol'rs for Def't.

Endorsed: Filed in clerk's office Feb'y 22, 1883. Walter S. Harsha, clerk.

51 At a session of the circuit court of the United States for the sixth circuit and eastern district of Michigan, continued and held on Tuesday, the tenth day of April, A. D. 1883, at the courtroom in the city of Detroit.

Present: Hon. John Baxter, judge.

STEWART HARTSHORN, Complainant,
vs. } In Equity.
THE SAGINAW BARREL COMPANY *et al.*, Defendants.

The above cause having been brought on to a hearing upon the pleadings and proofs, and after hearing S. D. Law, Esq., of counsel for complainant, and Charles J. Hunt, Esq., of counsel for defendants, and after due consideration thereof by the court, it is hereby ordered, adjudged, and decreed that the bill of complaint in said cause be, and the same is hereby, dismissed, with costs to the defendants to be taxed.

Endorsed: 2778. The circuit court of the United States for the eastern district of Michigan. In equity. Stewart Hartshorn, compl't, *vs.* The Saginaw Barrel Company *et al.* Decree. Filed in clerk's office April 10, 1883. Walter S. Harsha, clerk.

52 In the Circuit Court of the United States for the Eastern District of Michigan.

STEWART HARTSHORN

vs.

THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, & REUBEN KIMBALL.

Bill of Costs.

On trial by court	20 00	
On depositions, etc.	20 00	
		40 00
Cost of taking depositions	31 00	
Cost of certified copies and exemplifications	19 08	
Printing record	67 00	
Affidavit to bill of costs	25	
Taxation of costs	25	
William E. Hogan, 4 days' and 100 miles' travel	16 00	
Water B. Noyes, 1 day and 100 miles' travel	11 50	
		145 08
Total		$185 08

STATE AND EASTERN DISTRICT OF MICHIGAN, } *ss:*
County of Wayne, }

Charles J. Hunt, one of the solicitors of said defendant, being duly sworn, says that the foregoing items of costs charged as disbursements have actually been paid, or the liability therefor incurred, and were necessary and are reasonable in amount; that the witnesses above named were in good faith made to attend, and were deemed material and necessary, and they respectively travelled the number of miles and actually attended the number of days specified, and that the copies and exemplifications charged for were actually and necessarily used or necessarily and in good faith obtained for use.

CHARLES J. HUNT.

Sworn to and subscribed before me this seventh day of May, A. D. 1883.

H. S. SPRAGUE,
Notary Public.

53 To S. D. & J. T. Law, Esqs., solicitors for complainant:

Take notice that the foregoing is a copy of the defendant's bill of costs proposed to be taxed and of the affidavits to be read in support thereof, and that application will be made to the clerk of the said court to tax the same, at his office, on the — day of ——, A. D. 187–, at — o'clock m., dated this seventh day of May, A. D. 1883.

SPRAGUE & HUNT,
Solicitors for the Defendants.

We consent to the taxation of the within bill of costs at the sum of one hundred and eighty-five dollars and eight cents.

Dated this 16th day of May, A. D. 1883.

S. D. & J. T. LAW,
Solicitors for Complainant.

Endorsed: 2778. The circuit court of the United States for the eastern district of Michigan. Stewart Hartshorn *vs.* The Saginaw Barrel Co., A. W. Wright, *et al.* Taxed bill of costs of defendant. Clerk's office, *defendant*, A. D. 187–. I do hereby tax the costs — the def't at the sum of $185.08. Walter S. Harsha, clerk. Precipe for *fi. fa.* Let a writ of *fi. fa.* issue in this case. To the clerk of said court. Filed this 18th day of May, A. D. 1883. Walter S. Harsha, clerk.

54 At a session of the circuit court of the United States for the eastern district of Michigan, continued and held pursuant to adjournment, in the city of Detroit, on the — day of May, 1883.

Present: The Honorable Henry B. Brown, district judge, sitting as the circuit judge.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. D. BROCKWAY, and REUBEN KIMBALL.

The above cause coming on to be heard in pursuance of the order heretofore made therein on the 10th day of April, 1883, and the costs to the defendants having been taxed at the sum of one hundred and eighty-dollars and eight cents:

It is ordered, adjudged, and decreed that the defendants do recover of the complainant the sum of one hundred and eighty-five dollars and eight cents as costs in the above entitled suit.

HENRY B. BROWN.

Endorsed: 2778. Hartshorn *vs.* Saginaw Barrel Co. Filed in clerk's office May 8, 1883. Walter S. Harsha, clerk.

55 United States Circuit Court, Eastern District of Michigan. In Equity.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY and REUBEN KIMBALL.

Testimony taken on behalf of the party complainant under and pursuant to the 67th rule in equity (as amended) of the U. S. Supreme Court before S. Nelson White, Esq., a standing examiner of the U. S. circuit court, southern district of New York.

NEW YORK, *March 21st*, 1882—2 o'clock p. m.

Present: Mr. S. D. Law, of counsel for complainant, and Mr. Charles J. Hunt, of counsel for defendants.

Complainant's counsel puts in evidence a certified copy of the reissued letters patent No. 2756, granted to the complainant in this cause on the 27th day of August, 1867, and the same is marked "Complainant's Exhibit Reissue 2756," S. N. W., ex'r, March 21, 1882.

It is consented between the parties to this suit that the ordinary Patent Office copies of the various patents put in evidence by
56 either party may be substituted in the place of certified copies of said patents.

Complainant's counsel also put in evidence a copy of letters patent reissue No. 7370, granted to the complainant in this cause on the 31st day of October, 1876, and the same is marked "Complainant's Exhibit Hartshorn Reissue 7370," S. N. W., ex'r, March 21, 1882.

Complainant's counsel also puts in evidence a copy of letters patent reissue No. 7367, granted to the complainant in this cause, as assignee of William Campbell, on the 31st day of October, 1876, and the same [is] marked "Complainant's Exhibit Campbell Reissue 7367," S. N. W., ex'r, March 21, 1882.

Complainant's counsel also puts in evidence a copy of letters patent No. 69189, granted to Jacob David on the 24th day of September, 1867, and the same is marked "Complainant's Exhibit David Patent," S. N. W., ex'r, March 21, 1882.

Complainant's counsel also puts in evidence certified copies of decrees entered in the U. S. circuit court for the district of New Jersey in the suits of Stewart Hartshorn *vs.* Daniel Willis *et. al.*, and Hartshorn *vs.* Melville A. Fraser, said decrees being entered in September, 1878, and the same are marked "Complainant's Exhibit Willis Decree" and "Fraser Decree," S. N. W., ex'r, March 21, 1882.

Complainant's counsel also puts in evidence a certified copy of order for preliminary injunction made by the U. S. circuit court for the southern district of New York on the 15th day of May, 1880, in the suit of S. Hartshorn *vs.* Charles Floss, and the same is marked "Complainant's Exhibit Floss Order," S. N. W., ex'r, March 21, 1882.

57 Complainant's counsel also puts in evidence a certified copy of a decree made by the same court, and in the same suit last mentioned, on the 10th day of August, 1880, and the same is marked "Complainant's Exhibit Floss Decree," S. N. W., examiner, March 21, 1882.

Complainant's counsel also puts in evidence a certified copy of an order of attachment, made by the same court, and in the same suit last mentioned, on the 31st day of May, 1881, and the same is marked "Complainant's Exhibit Floss Attachment Order," S. N. W., examiner, March 21, 1882.

Complainant's counsel also puts in evidence a certified copy of the record in the suit of the Salem Shade-Roller Manufacturing Company *vs.* Wm. G. Harris, tried in the U. S. circuit court, in the district of Massachusetts, and heard in 1875, and the same is marked "Complainant's Exhibit Harris Record," S. N. W., examiner, March 21, 1882.

Complainant's counsel also puts in evidence a certified copy of the decree made in the last above-referred-to suit, and entered on the

22d day of December, 1875, and the same is marked "Complainant's Exhibit Harris Decree," S. N. W., examiner, March 21, 1882.

Complainant's counsel also puts in evidence certified copies of assignments under the David patent, No. 69189, as follows:

1. Assignment from Jacob David to Turner, Seymour & Judds, made on the 8th day of October, 1867, and recorded in the Patent Office in liber X 9, p. 79.

2. Assignment from Turner, Seymour & Judds to The Salem Shade-Roller Manufacturing Company, made on the 11th day of June, 1873, and recorded in the Patent Office in liber T 16, p. 406.

3. Assignment from The Salem Shade-Roller Manufactur-
58 ing Company to Daniel Low, James F. Almy, and Albert B.
Russell, made on the 14th day of April, 1877, and recorded
in the Patent Office in liber N 21, p. 221.

4. Assignment from Daniel Low, James F. Almy, and Albert B. Russell to James E. Maynadier, as trustee, made on the 1st day of August, 1878, and recorded in the Patent Office in liber H 23, p. 460.

5. Assignment from James F. Almy, Albert B. Russell, Daniel Low, and James E. Maynadier, trustee, to Stewart Hartshorn, the complainant, made on the 2d day of June, 1881, and recorded in the Patent Office in liber W 26, p. 184.

The said five assignments being under one certificate of the Patent Office of the date of February 25th, 1882, and the same are, collectively, marked "Complainant's Exhibit Assignments David Patent," S. N. W., Examiner, March 21, 1882.

Complainant's counsel also puts in evidence two shade-rollers, with a label, having thereon the name "Noyes' Improved Self-Acting Shade-Roller," and the same are marked "Complainant's Exhibit Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," S. N. W., Examiner, March 21, 1882.

It is admitted by the defendants' counsel that the defendants in this cause have made and sold shade-rollers like the Exhibit Saginaw Barrel Co.'s Roller previous to the commencement of this suit.

59 Mr. S. P. Kittle, a witness called on the part of the complainant, being duly sworn, deposes and says, in answer to interrogatories propounded to him by S. D. Law, counsel for complainant, as follows:

Q. 1. What is your name, age, residence, and occupation?

A. Samuel P. Kittle; aged 56 years; I reside in the city of New York, and am by profession a mechanician and mechanical expert in patent causes.

Q. 2. Have you any acquaintance with A. W. Wright, A. A. Brockway, and Reuben Kimball, or either of them, mentioned as defendants in this cause; and, if so, when and where did you make such acquaintance?

A. I don't know that I have any acquaintance with Messrs. Wright and Brockway. I called on Mr. Kimball at his residence in Saginaw city, in the State of Michigan, October 12th, 1881, and made his acquaintance then and there. Mr. Kimball is present in the room now.

Q. 3. What, if anything, do you know with reference to the connection of Mr. Kimball with the business of the defendant, The Saginaw Barrel Co., and how did you obtain such information?

A. In response to my inquiry, at the time and place named in the last answer, Mr. Kimball told me himself that he was the treasurer and general manager of that company.

Q. 4. Was anything said at that interview between you and Mr. Kimball in reference to the manufacture and sale of rollers like that shown in the Exhibit Saginaw Barrel Company's Rollers; and, if so, what? And had you previous to such interview any knowledge of rollers like that exhibit purporting to be made and sold by the Saginaw Barrel Company?

A. I had seen rollers like the exhibit on sale in the city of Detroit, and learned from parties there that the Saginaw Barrel
60 Company was introducing and selling them largely through the West; and I had also visited the works or manufactory of the Saginaw Barrel Company in Saginaw city, and inquired for Mr. Kimball, the general manager, and been shown through the manufactory and works of that company, and had been in the shade-roller department, where the parts of shade rollers like the exhibit were made and put together. I had again returned to the office of the company and purchased ½ doz. of the rollers for myself from a young man who claimed to be the treasurer's assistant, who gave me a receipted bill for the rollers I purchased, who also informed me that the company was manufacturing and selling rollers like the exhibit largely in the States of Michigan, Illinois, Minnesota, Wisconsin, Missouri, Indiana, Ohio, and Pennsylvania, and added that they were selling them pretty near everywhere, in some instances in 5 and 10 gross lots; and he thought I would find Mr. Kimball at his residence between 12 and 1 o'clock, where I went and found Mr. Kimball, as above stated, and told him that I came there in the interest of Mr. Hartshorn, the complainant in this case, and the substance of what I had learned in regard to the Saginaw Barrel Company's manufacture and sale of shade-rollers like the exhibit; that Mr. Hartshorn regarded it as an infringement of patents held and owned by him, and that I had acted as Mr. Hartshorn's mechanical expert, and that I regarded it as clearly an infringement of Mr. Hartshorn's patents, and warned him that Mr. Hartshorn would commence suit against him if they persisted in manufacturing and selling the same. I asked him, under such state of facts, whether he or the barrel company proposed to continue the manufacture and sale of the rollers. He said he only had my word for it that the roller was an infringement on Hartshorn's patents; he did not think it was; that they were prepared to manufacture and sell the rollers, and he thought they should continue.

61 Q. 5. What has been your experience in the examination of patents and patented and other inventions, and the comparison with each other of mechanical structures of various kinds to determine their similarity or dissimilarity, and have you been ac-

customed to act as an expert witness in patent cases; and, if so, for about how many years have you so acted, and in cases before what different courts?

A. I have been accustomed to examine mechanical constructions, patented and otherwise, very largely for the past thirty years. I have had granted to myself several patents. I was a patent solicitor in 1854 and '55, and have since then been frequently consulted as to similarities and differences of mechanical constructions, and have been accustomed to reading patents and descriptions of machinery and mechanism for the purpose of giving an opinion in regard to the identity, the similarity, or difference of such constructions. I was first called to give testimony before the court as a mechanical expert, I think, in 1854, and from that time to the present I have frequently and very largely acted as a mechanical expert witness in patent cases in the circuit courts of the United States in the eastern dist. of M'ch., the eastern dist. of Penn., the dist. of Mass., and in the northern, southern, and eastern dists. of N. Y.

Q. 6. Have you examined and are you familiar with the several letters patent marked "Complainants' Exhibits, Reissue 2756;" "Hartshorn Reissue, 7370;" "Campbell Reissue, 7367," and "David Patent, 69189," and do you understand the construction of the structures described in each of said patents and the action and operation of the several parts of such structures?

A. I have frequently had occasion to read the patents referred to in the Q., and am familiar with them and the constructions described and claimed in them severally, as to their parts, combinations, and operation.

62 Q. 7. Have you examined the rollers marked "Exhibits Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," and do you understand the construction of the same and the action of the operative parts thereof?

A. I have examined the rollers referred to and do understand their construction and the action of the operative parts of the same.

Adjourned to Wednesday, March 22d, 1882, at 10.15 a. m.

NEW YORK, *March* 22, 1882—10.15 a. m.

Met pursuant to adjournment.

Present: Counsel as before.

Examination of Mr. KITTLE resumed:

Q. 8. State whether, in your opinion, the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," contain and embody in their construction and operation the invention described and claimed in the patent "Complainant's Exhibit Reissue No. 7370," and give your reasons for any opinion you may express.

A. I think the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," embody the invention described and claimed in the reissue patent referred to in the question. There is this difference between those two roller exhibits, that No. 1 employs two pawls, whereas No. 2 has but one; which difference, however, is not material for the purposes and operation of the construction. The patent "Complainant's Exhibit Reissue No. 7370" describes an improvement in shade-fixtures which pertains to that class known as automatic stop-fixtures, as distinguished from spring, balance, and friction shade-fixtures, as well as other kinds which require special mechanism for operating the pawl and ratchet or device which holds the roller in any position. The Hartshorn improvement has, in common with earlier constructions of spring shade-rollers, a central pintle 63 fixed on one end of the roller on which the roller revolves in one of the brackets, while at the other end is applied a plate or cap with a central hole, adapted to embrace the spring-spindle on which said roller has its bearing and around which the roller revolves, the roller being hollow, to contain the spiral spring with the spindle around which the spring is wound, and the spindle has an end-bearing within the hollow roller and at its outer end is flattened or otherwise shaped, so as to slip in or connect with its bracket in a manner to prevent the revolution of the spindle, and the shade is made and attached to the roller in the old and well-know manner

With the above construction of spring shade-fixture, there was sometimes a weight used at the free or lower end of the shade, which was intended to counteract the force of the spring, while in other cases friction was mechanically applied and graduated for the same purpose, and in still others a pawl and ratchet was employed with special means for operating the pawl, so as to stop the roller and hold the shade at the desired height. Prior to the patent "reissue 7370," Mr. Hartshorn discovered and contrived means whereby he could check and hold a spring shade-roller with the shade, at any desired height, against the force of the spring by a special stop-works, which he termed the pawl and notched hub, with which, by simply manipulating the shade, he was able to prevent the engagement of the stop-works by allowing the spring to exert its full force to speed the revolution of the roller in winding up the shade, or cause the engagement of the pawl at any point by restraining the force of the spring, and so slowing the revolution of the roller, thus checking and holding the shade thereby at any desired height by such manipulation of the shade alone.

The stop-works above referred to was a notched hub on the end of the roller, which carried the spring and spindle and a pivoted pawl, which pawl was mounted on the spindle-bracket of the fixture. 64 The notches in this hub were at right angles to its axis, and arranged to engage with the pawl against the force of the spring, but were beveled at the opposite side or ends, and the pivoted pawl was the reverse of the notch, so that when the roller was revolved against the spring, by pulling the shade down, the pawl would slide out and over the notches, but when the force of the spring turned the roller in the opposite direction the pawl would gravitate into engagement with the notch as the notch passed around to it slowly. But if the notch came quickly under the full force of the spring it passed so rapidly that the pawl would not have time to gravitate into engagement, which operation was due mainly to the peculiar construction of the pawl and the notches. This, I think, was the first pure stop automatic shade-fixture.

Hartshorn, in his invention as described and claimed in the "reissue patent 7370," devised a way of fixing a pivoted pawl to the end of the shade-roller, in which was secured the spring and spring-spindle, and the ratchet or notch on the spindle or fixed part with which the pawl engaged, so that they acted substantially at right angles to each other, being located in such relation to each other and other parts of the fixture that the operation of all the parts is complete and successful to check and hold the roller and shade at any desired height by changing the speed of the revolution of the roller by the manipulation of the shade alone.

I find the invention set out and claimed in the Exhibit "Reissue Patent 7370," in the construction and operation of the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," because of the description in the reissue patent being applicable to and descriptive of the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," which I quote as to its class from the second paragraph of the patent—"in that class of shade-fixtures in which the shade roller is provided with a spiral spring for automatically winding up the shade"—and refer to the de-
65 scription, previously given by me in this answer, of the general characteristics of spring shade-fixtures, known and in use prior to the original Hartshorn invention above described by me, which early characteristics are found in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2." The pivoted pawl or pawls of these rollers are substantially identical with the pivoted pawls described in the reissue patent 7370; so are the ratchets and the parts and manner of connecting and operating them. The pawls are on the end of the roller, on a plate on the end of a roller, with the spring and the spring-spindle, and the ratchet is on the spindle, and the pawl and the ratchet are adapted to engage or not to engage the same, and under the same operation and for the same purpose as in the reissue patent, the description of which parts and their operation I quote, leaving out the figures and letters, because there are no such figures or letters in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," commencing with the twentieth line from the bottom of the second column of the first page of the Patent Office copy of the reissue patent 7370: "The end of the case or tube of the roller has a disc secured in it, and this disc, as the roller rotates, turns with it, and loosely on the fixed journal" (meaning the spring-spindle). "This disc has a pawl or detent attached to its inside," as shown more particularly, "and such pawl or detent, when engaged with the notch in the hub, retains or holds the roller so that it cannot turn under the influence of the spring and roll up the shade. Such pawl or detent is pivoted or hinged to the disc, and acts substantially at right angles to the notched hub or spindle. The spring, when fitted in the case, is attached at one end to the head, and by the other end to the fixed journal or spindle, or to its extension, and the spring is wound up by pulling down the shade; consequently when the shade is fully down the spring will have a

purposes and operation of the construction. The patent "Complainant's Exhibit Reissue No. 7370" describes an improvement in shade-fixtures which pertains to that class known as automatic stop-fixtures, as distinguished from spring, balance, and friction shade-fixtures, as well as other kinds which require special mechanism for operating the pawl and ratchet or device which holds the roller in any position. The Hartshorn improvement has, in common with
earlier constructions of spring shade-rollers, a central pintle
63 fixed on one end of the roller on which the roller revolves in one
of the brackets, while at the other end is applied a plate or cap with a central hole, adapted to embrace the spring-spindle on which said roller has its bearing and around which the roller revolves, the roller being hollow, to contain the spiral spring with the spindle around which the spring is wound, and the spindle has an end-bearing within the hollow roller and at its outer end is flattened or otherwise shaped, so as to slip in or connect with its bracket in a manner to prevent the revolution of the spindle, and the shade is made and attached to the roller in the old and well-know manner

With the above construction of spring shade-fixture, there was sometimes a weight used at the free or lower end of the shade, which was intended to counteract the force of the spring, while in other cases friction was mechanically applied and graduated for the same purpose, and in still others a pawl and ratchet was employed with special means for operating the pawl, so as to stop the roller and hold the shade at the desired height. Prior to the patent "reissue 7370," Mr. Hartshorn discovered and contrived means whereby he could check and hold a spring shade-roller with the shade, at any desired height, against the force of the spring by a special stop-works, which he termed the pawl and notched hub, with which, by simply manipulating the shade, he was able to prevent the engagement of the stop-works by allowing the spring to exert its full force to speed the revolution of the roller in winding up the shade, or cause the engagement of the pawl at any point by restraining the force of the spring, and so slowing the revolution of the roller, thus checking and holding the shade thereby at any desired height by such manipulation of the shade alone.

The stop-works above referred to was a notched hub on the end of the roller, which carried the spring and spindle and a pivoted pawl,
which pawl was mounted on the spindle-bracket of the fix-
64 ture. The notches in this hub were at right angles to its
axis, and arranged to engage with the pawl against the force of the spring, but were beveled at the opposite side or ends, and the pivoted pawl was the reverse of the notch, so that when the roller was revolved against the spring, by pulling the shade down, the pawl would slide out and over the notches, but when the force of the spring turned the roller in the opposite direction the pawl would gravitate into engagement with the notch as the notch passed around to it slowly. But if the notch came quickly under the full force of the spring it passed so rapidly that the pawl would not have time to gravitate into engagement, which operation was due mainly to

the peculiar construction of the pawl and the notches. This, I think, was the first pure stop automatic shade-fixture.

Hartshorn, in his invention as described and claimed in the "reissue patent 7370," devised a way of fixing a pivoted pawl to the end of the shade-roller, in which was secured the spring and spring-spindle, and the ratchet or notch on the spindle or fixed part with which the pawl engaged, so that they acted substantially at right angles to each other, being located in such relation to each other and other parts of the fixture that the operation of all the parts is complete and successful to check and hold the roller and shade at any desired height by changing the speed of the revolution of the roller by the manipulation of the shade alone.

I find the invention set out and claimed in the Exhibit "Reissue Patent 7370," in the construction and operation of the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," because of the description in the reissue patent being applicable to and descriptive of the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," which I quote as to its class from the second paragraph of the patent—"in that class of shade-fixtures in which the shade roller is provided with a spiral spring for automatically winding up the shade"—and refer to the de-
65 scription, previously given by me in this answer, of the general characteristics of spring shade-fixtures, known and in use prior to the original Hartshorn invention above described by me, which early characteristics are found in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2." The pivoted pawl or pawls of these rollers are substantially identical with the pivoted pawls described in the reissue patent 7370; so are the ratchets and the parts and manner of connecting and operating them. The pawls are on the end of the roller, on a plate on the end of a roller, with the spring and the spring-spindle, and the ratchet is on the spindle, and the pawl and the ratchet are adapted to engage or not to engage the same, and under the same operation and for the same purpose as in the reissue patent, the description of which parts and their operation I quote, leaving out the figures and letters, because there are no such figures or letters in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," commencing with the twentieth line from the bottom of the second column of the first page of the Patent Office copy of the reissue patent 7370: "The end of the case or tube of the roller has a disc secured in it, and this disc, as the roller rotates, turns with it, and loosely on the fixed journal" (meaning the spring-spindle). "This disc has a pawl or detent attached to its inside," as shown more particularly, "and such pawl or detent, when engaged with the notch in the hub, retains or holds the roller so that it cannot turn under the influence of the spring and roll up the shade. Such pawl or detent is pivoted or hinged to the disc, and acts substantially at right angles to the notched hub or spindle. The spring, when fitted in the case, is attached at one end to the head, and by the other end to the fixed journal or spindle, or to its extension, and the spring is wound up by pulling down the shade; consequently when the shade is fully down the spring will have a

tendency to wind it up. The pawl or detent engages itself 66 with and disengages itself from the notched hub automatically." So that I say I find in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," a spring shade-roller having a pawl or detent and ratchet, or their equivalents, constructed and arranged so as to engage automatically for holding the shade at any desired point or height, in combination with a ratchet, or its equivalent, upon a stationary spindle or stationary part of the fixture of a hinged or pivoted pawl placed upon the end of a roller, acting substantially at right angles to the ratchet or notched hub. (See the claim of Complainant's Exhibit "Reissue patent No. 7370.")

The specification of Exhibit "Reisue Patent 7370" describes a construction of pawl and ratchet, which operate and connect for checking and holding the shade at any desired height, or allowing the spring to roll up the shade automatically by the manipulation of the shade, which are attached at one and the same end of the roller in such relation that when in engagement they operate to fix the relation of the roller and the spindle against the force of the spring when in and out of the brackets the same. But this characteristic of construction is not claimed in the reissue; I mean the holding or preventing the spring from unwinding when the roller is removed from the brackets.

Q. 9. State by what force the pawls, as described in Complainant's Exhibit "Reissue No. 7370," are prevented from engaging and by what force they are made to engage with the ratchet?

A. They are prevented from engagement by centrifugal force; they engage by the force of gravity.

Q. 10. State by what force the pawl or pawls, as shown in the Exhibits "Saginaw Barrel Company's Rollers, No. 1 and No. 2," are prevented from engaging and by what force they are made to engage with the ratchet.

A. They are prevented from engagement by centrifugal force, and they engage by the force of gravity.

67 Q. 11. State whether, in your opinion, the Exhibits "Saginaw Barrel Company's Rollers, No. 1 and No. 2," contain and embody, in their construction and operation, the invention described and claimed in the patent, Complainant's Exhibit "Campbell Reissue No. 7367," and give your reasons for any opinion you may express.

A. I think they do. The invention divulged in the patent referred to in the question consists, I think, in the construction and employment of pawls adapted to move into and out of engagement with ratchets, and which are adapted to engage with the pawls, when the shade is being wound up by the force of the spring; and that these pawls are located on the roller over notches on the spring-spindle, in that character of roller which I have previously described as an automatic spring shade-roller, embracing the general characteristics which I have attributed to such fixtures, prior to the original invention of Hartshorn.

The pawls in the "Campbell Reissue" are distinguished from pawls previously known or employed with shade fixtures by being

held and operated loosely, and not fastened to a fixed pin or pintle; and further, by the engaging part of the pawls and notches being so formed and adapted to each other that the pawls slide into, and out of, engagement freely and effectively, as desired, in drawing down the shade and by slowing or restraining the revolution of the roller under the force of the spring, while they do not engage, or operate, or interfere in the rapid revolution of the roller. This Campbell stop-works, or pawl and detent, is distinguished further by both the pawl and detent being attached to the roller in such relation as that they lock the spring by the pawl overlapping the roller and spindle, or parts attached thereto, in such manner as to fix their relation and prevent the unwinding of the spring, when the roller is in or out of the brackets alike, which could not be accomplished
68 when either the pawl or ratchet was located on the bracket and the opposite part of the roller.

In such case there would necessarily have to be some auxiliary device to prevent the spring from unwinding when the roller is removed from the brackets, which Campbell's improvement obviates.

The Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," have not pawls that operate loosely like the Campbell pawls, but they have pawls and ratchets at the spindle and spring end of the roller in such relation and of such character and operation as that described in the "Campbell Reissue 7,367" for checking and holding the roller at any desired height by the manipulation of the shade alone, and without resort to auxiliary means for that purpose. And these parts (the detent and ratchet) are of such character and construction, and so adapted to each other, and placed in such relation as that they operate to hold the roller and the spring spindle in fixed relations against the force of the spring, in and out of the brackets alike, so that, when the roller is removed from the brackets, the spring will be prevented from running down by the engagement of the detent and ratchet. The Exhibit "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," pawls or detents are within the periphery of the roller; they bind against the spindle, and prevent the revolution of the roller; they engage with the ratchet by the force of gravity; they are held from engagement by centrifugal force; they are mounted or held in the roller, of which the spring-spindle is a part, and bears the engaging notch or ratchet.

I find the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," to contain and embody the characteristic elements of the Campbell invention, as grouped and covered by the first claim of that reissue. I quote: "In a spring shade-roller, having a pawl or detent and a ratchet, or their equivalents, so arranged as to allow the shade to be drawn down or run up without obstruction, and which engage automatically with each other to hold the shade in
69 any desired position, the arrangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that, when the roller is removed from its brackets, the tension of the spring will be preserved."

I do not find in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," the embodiment of the mechanism described and claimed in the second and third claims of the "Complainant's Exhibit Campbell Reissue 7367."

Q. 12. You have spoken of a difference, in form and attachment, between the pawl shown in the "Campbell Reissue No. 7367" and the pawls found in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2"; do you consider such difference, in form and attachment of said pawls, material or important in respect to or under the first claim of the "Reissue No. 7367?"

Objected to as leading.

A. I do not.

Q. 13. State whether, in your opinion, the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," contain and embody, in their construction and operation, the invention described and claimed in the patent, Complainant's Exhibit "David Patent No. 69189," and give your reasons for any opinion you may express.

A. I think they do. The David construction of pawl and ratchet, as set out in the David patent referred to, is a different stop-works on shade fixtures of the character previously described by me as existing before the original Hartshorn patent, as well as different from that original Hartshorn stop-works as described in Complainant's Exhibit "Reissue 2756," and it consisted in a groove with parallel sides running from the periphery on an incline toward the axis of the roller and out at its spindle end, into which groove was fitted, loosely, a bar which was fastened at its inner end by a hinge
70 to the roller; the outer end extended beyond the end of the
roller, and was allowed to vibrate freely toward and from the end of the spring-spindle and axis of the roller. This bar, being carried around with the roller, acted much like a latch in a catch, as it was borne up on the inside of the spindle-bracket. The catch on the spindle-bracket was over its embracing socket and angular projecting end of the spring-spindle. To form this catch an inward projection on the bracket was had somewhat of a scroll form, with its greatest area cut vertically to the axis of the spindle and roller, thus affording a notch to engage the bar or latch in the revolution of the roller under the force of the spring, into which notch it would drop and hold the roller with the shade at any desired height. But the scroll and latch or bar offer no resistance to the revolution of the roller in the opposite direction—that is, when the shade was drawn, the spring thereby being wound up.

In the rapid revolution of the roller this bar would skip over and not catch in the notch; and in the very rapid revolution of the roller the end of the bar would be thrown wholly clear of the scroll or notched hub by centrifugal force; but by restraining the force of the spring and slowing the revolution of the roller the bar would engage the notch by the force of gravity, and act to check and hold the roller with the shade at the desired height, being operated automatically by the manipulation of the shade. It will be observed that this stop-works differs from the automatic stop-works of the original Hartshorn patent above referred to, by having the detent or bar attached to and revolving with the roller, while the notched hub is on the bracket. Exactly the reverse in that respect was the construction of the original Hartshorn.

I find the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," employ a detent, arranged upon the roller in such manner that it moves towards and away from the center or axis of the 71 roller by the force of gravity and by centrifugal force, substantially as described in Complainant's Exhibit "David Patent No. 69189," and as claimed in the first claim of that patent, which I quote:

"The arm or detent *k*, arranged upon the roller in such a manner that it moves towards and away from the center or axis of the roller *a* by the action of gravity and centrifugal force, substantially as described."

I do not say that the detent in Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," is identical with that in the David patent, nor is it arranged or applied identically as the detent is in that patent, but I do say that such differences are not material, in view of their function and operation and the words of the David claim of the specification above quoted.

I also find in the Complainant's Exhibit "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," the embodiment of the parts grouped and covered by the second claim of the David patent, which I quote:

"The combination and arrangement, at the same end of a shade-roller, of the spring *e*, the rod *d*, and the arm or detent *k*, or their mechanical equivalents, substantially as described."

Counsel for complainant puts in evidence the file wrapper of the Campbell patent No. 69176, dated Sept. 24th, 1867, and the same is marked Complainant's Exhibit "Campbell File Wrapper," March 22, 1882. S. N. W., examiner.

Counsel for complainant puts in evidence the file wrapper and contents of the David patent, No. 69189, dated Sept. 24th, 1867, and the same is marked Complainant's Exhibit "David File Wrapper and Contents," March 22, 1882. S. N. W., examiner.

Cross-examination by Mr. HUNT:

72 X Q. 14. Speaking of the David patent, what is the office of the arm or detent *k*, mentioned in the first claim of that patent?

A. It is the part or element which engages with the notch *j* to check and hold the roller with its shade at any desired height, and to be carried round with the roller and above the notch by centrifugal force to allow the shade to be wound up.

X Q. 16. Do you mean by the use of the word "check" there that it stops the roller?

A. Yes.

X Q. 16. Stops it absolutely, does it?

A. It does stop it absolutely, in connection with the notch.

X Q. 17. What office does this arm or detent perform, if any, when the curtain is drawn down?

A. It is carried round with the roller and in position to operate, whenever it is desired to have it; and if the roller is slowly stopped in drawing the shade down it would ride the scroll-shaped hub as it came round to the upper side, resting by gravity and sliding thereon.

X Q. 18. Is the arm or detent *k*, arranged upon the roller as specified in this first claim, of any use whatever when the part *j* of the journal-box, or its equivalent, is wanting?

A. No.

X Q. 19. Do you find that part *j* of the journal-box in the Exhibits "Saginaw Barrel Company's Rollers, No. 1 and No. 2?"

A. Yes. The part *j* in the David patent has its mechanical equivalent in the Exhibits "Saginaw Barrel Company's Rollers, No. 1 and No. 2," in the hub with holes or depressions, which is fast on the spring-spindle. That is the stationary part or non-revolving part of the fixture, against which the detent, which is attached to the revolving part, holds, to prevent the revolution of the roller and to retain the shade at any desired height. And the spring-spindle in the "David patent," as in the Exhibits "Saginaw Barrel Company's Rollers, No. 1 and No. 2," is fixed and non-revolving in both the same by their connection with the bracket.

73 X Q. 20. Was this arrangement of the hub in the Exhibits "Saginaw Barrel Company's Rollers, No. 1 and No. 2," known as a mechanical equivalent to the projection *j* in the David patent, in certain fixtures prior to the date of the David patent?

A. No; I don't know that it was. I think the court has held in several cases, however, under the Hartshorn reissue, 2,756, that such modification or change was not enough to constitute invention. I think myself, for the purposes of the construction and operation, as described in the David patent, they are the same.

X Q. 21. You have testified that the David patent has a different stop-works on shade-fixtures from those previous to the first Hartshorn patent, as well as different from that; now, are not the Exhibits "Saginaw Barrel Company's Rollers, No. 1 and No. 2," as much or more of a change from the David patent as the David patent is from the Hartshorn?

A. I think not. The first Hartshorn pawl was only actuated by the force of gravity or by a spring force, especially for the purpose of throwing it into engagement, and it slid over or bounced over the notches; whereas David utilized by his construction another and different force, to wit, centrifugal force, for preventing the pawl or detent from riding the hub and for throwing it clear from the same. I find no new principle or force employed in the Exhibits "Saginaw Barrel Company's Rollers, No. 1 and No. 2," but, on the contrary, I find the same force, in principle and mode of operation, employed for the engagement or non-engagement of the pawl with the ratchet or notch as that described in the David patent and claimed in the claims, as I have before stated.

Adjourned to Thursday, March 23d, 1882, at 10 o'clock a. m.

74 New York, *March* 23, 1882—10 a. m.

Met pursuant to adjournment.
Present: Counsel as before.

Cross-examination of Mr. Kittle resumed:

X Q. 22. What is claimed in the 1st claim of the David patent?

A. On a spring shade-roller of the automatic class, as before described by me, a detent mounted in such manner that it moves toward and away from the centre or axis of the roller under the influence of the force of gravity or centrifugal force, for the purpose of engaging or not engaging with some sort of ratchet or notch, as described in that patent.

X Q. 23. Is there anything said in the claim about its engaging or not engaging with any ratchet or anything else?

A. No. I say that because it is a part of the construction, and there can be no other use in such construction and operation, and think the words "substantially as described" in that claim carry with them that interpretation when fairly considered.

X Q. 24. What is the office of the detent *k*, as specified in the claim?

A. To co-operate with the other parts of the construction, and, in the manner therein described, for holding the shade at any desired height, and allowing it to be run up and down, being constructed and operated as stated.

X Q. 25. The arm or detent *k*, being mentioned specifically in the claim, does that, in your opinion, limit the claim to a detent constructed in the same manner and shape as the detent *k* shown in the drawing?

A. Not specifically. I think it limits the detent to a construction
in which it shall be pivoted or hinged to the end of the roller, and
which is operated toward and from the axis of the roller by
75 centrifugal force and gravity for the purposes specified in the
patent.

X Q. 26. If this detent is operated simply by the force of gravity to move to and from the centre of the roller, would it then be the detent claimed?

A. I think not; I think that centrifugal force must be employed, or act upon the detent in its operation, or it must be a construction capable of action by such force in part.

X Q. 27. Will you look at the second claim of the patent and tell me what combination is covered by that claim?

A. The combining and arranging at the same end of the roller the spring, the spindle or rod, and the detent, or their mechanical equivalents.

X Q. 28. Does the designating of these different elements by letters limit the claim to the devices shown?

A. Yes; but not specifically as shown. The devices would have to be for the same purpose and operate in the same manner, and combine in the same way, and produce the same result substantially, but not specifically, in my opinion. The patent shows and describes one way or one construction for accomplishing certain results; the breadth of the field of mechanical equivalents depends upon other circumstances.

X Q. 29. By what letters are the elements in the second claim designated?

A. The spring *e*, the rod *d*, the detent *k*. These, or their equivalents, must be combined at the end of a shade-roller, for the purpose substantially as described in the patent.

X Q. 30. Will you show me the spring *e* in the drawing of this patent?

A. I suppose it is the only spring in the drawing. I only see one spring. I believe in the drawing it is marked *c*, and in the body of the specification it is referred to as spring *c*, and the plate in which the detent vibrates is marked *e*.

76 X Q. 31. How do these four elements work together, and what is the effect produced by their operation?

A. The roller carries all. The spindle or rod is held in the roller by the end plate being adapted to revolve around it and the opposite end of the spindle in the end of the cavity or block therein, and the spring is wound round the spindle and secured to it at one end, and to a sliding block (for special purposes) at the opposite end, so as to connect the spring thereby to the roller. The pawl is also connected at the same end of the roller, and of such character as to engage with a notch or ratchet on the fixed or non-revolving part, to wit, the rod or spring-spindle, so that when the rod carrying the spring is held, and the roller revolved round it in one direction, the spring will be wound up, to wit, in the operation when the shade is drawn down and unwound, when the force of the spring winds the shade up.

X Q. 32. Why do you add, in this description of the claim, the block on the spindle, which is put there, as you say, for a special purpose?

A. Because it is through the block that the spring is connected with the roller.

X Q. 33. In your opinion does this block on the spindle and the cross-head described in the specification as attached to it, form any part of the combination and arrangement claimed in the 2d claim of the David patent?

A. I think not; it is for another purpose, to wit, a means of adjustment of the spring longitudinally under the different degrees of tension put upon it, and is not material or necessary for the successful or automatic operation of the fixture, as described in the David patent.

X Q. 34. Does that block revolve with the spindle?

A. No, sir.

X Q. 35. Does it move horizontally upon the spindle?

A. It is so described.

77 X Q. 36. How does it regulate the length of the spring on the spindle?

A. It does not regulate the length; it moves with the spring on the inner end of the spindle as it is shortened or lengthened according to the tension put upon the spring.

X Q. 37. Why does it move with the spring longitudinally?

A. In coiling the spring closely upon the rod or spindle it tends to create a longitudinal tension or draught. The spring being attached to the block, and through it to the roller, the block is drawn back and forth.

X Q. 38. Could the spring as shown in this patent be wound up without the use of this block and its connection with the roller?

A. I think if the block was entirely removed and the spring attached directly to the roller, as is common with this class of rollers, the operation of the spring would be the same in winding and unwinding, for the other purposes of the construction.

X Q. 39. The question was confined to construction, as shown in the patent; I don't want you to travel outside of the patent, and construct another and different roller, and then say we infringe. Will you confine your answer to the device shown in the drawing of the patent?

A. My answer to the present question is my last previous answer. I understood then, and I now understand, that I am asked whether the spring, as shown in the patent, could be wound up without the employment of the sliding block. I think it could. I do not mean to say that it is so shown and described. The patent speaks for itself on that.

X Q. 40. Does the patent describe any other means of connecting the spring to the roller than this block?

A. Not specifically, nor does it, in my opinion, directly or indirectly, claim that specific means of connecting the spring to the roller, for the reasons before given by me.

78 X Q. 41. Does it claim any means whatever of connecting the spring with the roller?

A. I think so, but not in terms. The words "substantially as described" in the patent, I think, take in the construction and combination of parts not specially mentioned, as well as those mentioned, sufficient for an operative construction, which would not be the case unless the spring was, in some manner, connected with the roller as well as the spindle.

X Q. 42. What is the office of the rod *d* in connection with the roller?

A. To sustain the spring, the same as in all that class of rollers carrying spindles and springs, and to supply a journal for the roller to revolve on, and to connect, in some manner, with a ratchet, as it is held in its angular or other shaped end, in the bracket, from revolving.

X Q. 43. Does the ratchet you mentioned in your previous answer form any part of the combination and arrangement claimed in this second claim?

A. I think so; because the construction described is for a practical construction and result and an improvement in spring shade-fixtures, employing a pawl and ratchet in a practical manner; that is, automatic spring shade-fixtures where a pawl and ratchet are

made to engage or not, or to check the roller, with the shade at any desired height, by the manipulation of the shade alone. The inventor says, 4th paragraph of his specification: "This invention consists in a novel construction of shade-fixture, in which I arrange the spring that winds up the shade, and the detent that arrests the action of said spring in the same end of the roller, whereby I am enabled to combine a spring and detent with a common, solid wooden roller, * * * so that it can be fitted to a window, * * * in the same manner as plain rollers without automatic spring fixtures are now fitted. My invention is applicable to shade-rollers of any material." I quote again from the 8th paragraph: "The
height of the part *j* of the journal-box is such as to
79 allow the arm *k* to fall against it when it is near the center
of the roller, which position it occupies whenever the roller, in turning, brings the arm above the axis, unless when turned at a high speed, in which case centrifugal action carries the arm far enough away from the axis or center of the roller to allow it to pass over the side of the box," etc. I think the ratchet is clearly and fairly covered in the words "substantially as described."

X Q. 44. Do you find any mention of the ratchet in the statement of the inventor of his invention; that is, his statement of what it consists?

A. I find the ratchet described in the 8th paragraph quoted in my last answer.

X Q. 45. I mean do you find it in the 4th paragraph?

A. I do not in the 4th paragraph referred to.

X Q. 46. Is it referred to in the 2d claim by any terms or letters?

A. No; no further than is taken in by the phrase "substantially as described."

X Q. 47. Would the combination claimed in the 2d claim be an operating combination without some means of fastening one end of the spring to the roller and the other to the spindle, and the ratchet on the bracket or spindle?

A. Yes; I think it might be constructed, the ratchet might be fairly located within the patent, without being on either the spindle or bracket, but over the spindle secured to the window-casing. I think the construction requires a non-revolving ratchet, or a ratchet located on the non-revolving part of a fixture, so that the pawl which revolves with the roller and operates by the forces described in the patent, should engage with it or not under the operation specified. I do not think the construction would be operative without the spring being connected, one end to the roller and the other to the spindle, to be covered by the claim referred to.

80 X Q. 48. In the Hartshorn reissue 2756 to what is the pawl pivoted?

A. To one of the brackets in which the roller is hung.

X Q. 49. Does the claim of this patent cover a bracket or a pawl pivoted to the roller and revolving with the roller or not?

A. I think it does cover a pawl, however connected with a ratchet, which act together automatically, so that the pawl will engage the ratchet at any point or height of the shade by simply checking or slowing the rotation of the roller in the upward movement of the shade by the manipulation of the shade alone without the employment of other or auxilliary means of operating the pawl.

X Q. 50. Does the claim of this reissue, 2756, cover the devices shown in the Complainant's Exhibits "Saginaw Barrel Co.'s Rollers, Nos. 1 and 2?"

Objected to as not cross-examination, and that counsel for the defendants thereby makes the witness his own.

A. I think so.

X Q. 51. What is the invention described and claimed in "Hartshorn reissue 7370?"

A. It is an improvement on the construction of shade-fixture referred to in the last two previous questions above, in which the pawl and ratchet or notched hub, designed and used to arrest the rotation of and hold the roller, as described in the previous patent, is transferred from the bracket to or mounted on the roller by a hinge or pivot on the end of the roller, or fixed thereto, and which revolves with the roller, while the notched hub or ratchet is placed upon the spindle or stationary part of the fixture, such parts being so constructed and arranged as to engage automatically for holding the shade at any desired point or height, the pawl and ratchet acting substantially at right angles to each other.

81 X Q. 52. Is that part, acting substantially at right angles to the ratchet or notched hub, a substantial part of this invention?

A. That is the language of the claim: "and acting substantially at right angles to the ratchet or notched hub." I don't suppose that that would limit that action to anything more than approximately at right angles.

X Q. 53. Do you find any such action in the Complainant's Exhibit "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2?"

A. Yes.

X Q. 54. Instead of acting at right angles, are not the ratchet and the pawls in the same vertical plane?

A. The action of the pawl, in its passing in and out of the ratchet in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," is substantially at right angles to each other and act substantially the same as they do in the "Hartshorn reissue 7370." The ratchet in the rollers and in the patent are fixed ratchets on the spindle, and the pawl or pawls in both are hinged or pivoted pawls, carried round with the roller, being pivoted to a plate on the end of the roller, dropping in and being raised out of the ratchet in substantially a vertical line, so that whatever is true of the action of the pawl in the "reissue patent 7370" is true of the action of the pawl in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2." I think the pawl in both cases acts substantially at right angles to the ratchet or notched hub, as described and claimed in the "Hartshorn reissue No. 7370."

X Q. 55. Are not the ratchet and pawl in this "reissue 7370" shown in the drawing in the same vertical plane?

A. Yes; the engaging parts are so shown and as engaged in figures 2 and 3.

X Q. 56. I find in this patent a disclaimer; what is the effect of that disclaimer upon this claim?

82 A. Its effect is to limit this construction to the employment of the pawl and ratchet, as described and claimed, to a pivoted pawl connected to and revolving with the roller, and a ratchet on the spring-spindle in the roller as a stationary part when connected with its bracket for the purposes of checking the rotation of the roller and holding the shade at any desired height, and the automatic action of the engaging parts by the manipulation of the shade alone for that purpose when the roller is in its bracket, and not for the purpose of locking or holding the roller and the spindle in fixed relation, so that the shade will not unwind when the roller is taken out of its brackets.

X Q. 57. Do you mean by that that the Campbell invention allowed the spring to unwind when the roller was taken out of its brackets?

A. No.

X Q. 58. Then did the Campbell invention cover that part of the Hartshorn improvement in "reissue No. 7370?"

A. The Campbell invention anticipated that part of the operation of the Hartshorn construction, as I understand it.

X Q. 59. Did the pawls in the Campbell invention work substantially at right angles to the ratchet or notched spindle, the same as the pawls worked at right angles to the notched hub or spindle as described and claimed in the "Hartshorn reissue 7370?"

A. The pawls in both of the constructions referred to moved in and out of engagement with the ratchet or notched hub or spindle substantially at right angles thereto; but the construction for holding and controlling that action was a different construction in the two rollers mentioned—that is to say, the Campbell pawl is a loose pawl or a pawl held loosely in a hole, cavity, or chamber in the roller, while the Hartshorn pawl is a pivoted or hinged pawl on the roller.

83 X Q. 60. Was not the Hartshorn pivoted or hinged pawl a very old and well-known device at the time Campbell made his invention and used in the same manner as his device on ratchet-wheels?

A. Pivoted pawls are very old, undoubtedly, and were used for many different purposes before Campbell's invention. But I do not think a pivoted pawl on the end of a spring shade-roller, in connection with a ratchet on a spindle or non-revolving part of the roller, with a pawl and ratchet adapted to engage or not, to check and hold a roller with a shade at any desired height automatically, by the simple manipulation of the shade, was old, or, as far as I have been able to learn, known before such construction, combination, and operation was devised and made in the manner and for the purpose specified by Hartshorn in his patent Complainant's Exhibit "Reissue 7370."

X Q. 61. I find in this Campbell patent, which is disclaimed in the Hartshorn patent, a claim of which the following is a part: "In a spring shade-roller having a pawl or detent and a ratchet, or their equivalent." Does that expression cover the hinged pawl and notched hub of the "Hartshorn reissue 7370?"

A. I think so, because there are no words in the claim limiting the character of pawl or detent and notch or ratchet further than that they shall be of such character and adaptation to each other and to the other parts of the construction that they shall form a spring shade-fixture so arranged as to allow the shade to be drawn down or run up without obstruction, and which engage automatically with each other to hold the shade in any desired position; the arrangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that when the roller is removed from its brackets the tension of the spring will be preserved—that is to say, in any automatic spring shade-roller having a pawl and
ratchet that operate together by the manipulation of the shade
84 to check and hold the roller at any desired height without
the aid of any auxiliary device for such purpose, when the roller is in its brackets, and which operate also to fix the relation of the roller and spring-spindle and spring when in engagement alike successfully in or out of the brackets, and will not allow the spring to run down when the roller is removed from the brackets, is the construction described in the "Campbell reissue 7367," and claimed in the first claim, as I understand it.

Adjourned to Saturday, March 25th, 1882, at 10.30 a. m.

NEW YORK, *March* 25, 1882—10.30 a. m.

Met pursuant to adjournment.
Present: Counsel as before.

Redirect examination of Mr. KITTLE:

Redir. Q. 62. Are or are not the ratchets in the "Saginaw Barrel Co.'s rollers, No. 1 and No. 2," and in the "David patent," non-revolving ratchets alike in both?

A. They are.

Redir. Q. 63. Does or does not the pawl or pawls in the "Saginaw Barrel Co.'s rollers, No. 1 and No. 2," and in the "David patent," engage with the ratchet by the action of gravity alike in both?

A. They do.

Redir. Q. 64. Does or does not the pawl or pawls in the "Saginaw Barrel Co.'s rollers, No. 1 and No. 2," and in the "David patent," disengage from the ratchet by the action of the revolution of the roller in pulling down the shade?

A. They do.

Redir. Q. 65. Are or are not the pawl or pawls in the "Saginaw Barrel Co.'s rollers, No. 1 and No. 2," and in the "David patent," held from engaging with the ratchet by the action of centrifugal force alike in both?

A. They are.

85 Redir. Q. 66. Would not the ratchet in David's roller be substantially the same in its construction and operation

whether located on the spindle or on the bracket which holds or prevents the spindle from revolving?

A. I think so for the purposes of the ratchet as described and claimed in that patent.

Redir. Q. 67. Is or is not the action of the pawl and ratchet in holding the roller in both the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," and in "Hartshorn Reissue No. 7370" substantially at right angles and the same in both?

A. Yes.

Redir. Q. 68. Do or do not the pawls in the Exhibits "Saginaw Barrel Co.'s Rollers, No. 1 and No. 2," and in the "Hartshorn Reissue No. 7370" in engaging and disengaging with the ratchet move in a vertical plane alike?

A. They do.

Redir. Q. 69. Look at X Q. 59 and state what you mean by the pawls in the Hartshorn and Campbell Reissue moving in and out of engagement with the ratchet substantially at right angles?

A. I mean the pawls are carried around with the rollers to which they are connected, and in pulling the curtain down one-quarter turn, more or less, the pawl is raised or passed to a point or circle which would pass outside or vertically above the notch; and in the engagement of the pawl with the notch it rides on such circle or hub and drops at right angles substantially thereto into engagement.

S. P. KITTLE.

Sworn beforn me—

S. NELSON WHITE,
Examiner.

Adjourned subject to notice.

86 United States Circuit Court, Eastern District of Michigan.
In Equity.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY and REUBEN KIMBALL.

Testimony taken on behalf of the complainant in rebuttal, at the city of New York, under and pursuant to the 67th rule in equity, as amended, of the U. S. Supreme Court, before S. Nelson White, Esq., one of the standing examiners of the circuit court of the U. S. for the southern district of New York.

NEW YORK, *October 24th,* 1882.

Present: Mr. S. D. Law, of counsel for complainant; Mr. Charles J. Hunt, counsel for defendants.

Mr. HENRY B. RENWICK, being called by complainant and duly sworn, deposes as follows:

Q. 1. What is your name, age, residence, and occupation?

A. Henry B. Renwick, aged 65; I reside in New York city, and am by profession a civil and mechanical engineer, and have been for many years chiefly occupied about matters relating to patents and patented inventions.

Q. 2. State generally what has been your experience before the courts in matters relating to patent litigations, as an expert.

87 A. For the last 28 years I have been frequently during each year examined as an expert in cases in which patents were in question.

Q. 3. Have you examined and do you understand the patent, Complainant's Exhibit Reissue 2756, granted to Stewart Hartshorn and the letters patent 44624, which are the original of said reissue 2756, also granted to said Hartshorn?

A. I have frequently and carefully examined the original patent and the reissue referred to in the question, having first examined them several years ago, and believe I understand the shade-roller described therein and the invention referred to in the claims thereof.

Q. 4. Have you read and do you understand Complainant's Exhibit David Patent No. 69189, granted September 24, 1867?

A. I have frequently examined the David patent referred to in the question, and believe I understand the improvement in shade-rollers described therein and the invention referred to in the claims thereof.

Q. 5. Have you examined and do you understand the letters patent Complainant's Exhibit Campbell Reissue 7367 and the letters patent 69176, which are the original of said reissue 7367?

A. I have frequently and carefully examined both the original and reissued letters patent to Campbell referred to in the question, and believe I understand the shade-roller which is described both in the original and the reissue, and the invention referred to in the claim of the original and the claims of the reissue.

Q. 6. Have you examined and do you understand the letters patent Complainant's Exhibit Hartshorn Reissue 7370 and the letters patent 68502, which are the original of said reissue?

A. I frequently and carefully examined both the original and reissue of the patents to Hartshorn referred to in the question, and believe I understand the contrivances described therein and referred to in the claims both of the original and the reissue.

88 Q. 7. Have you examined and do you understand the letters patent Defendants' Exhibit Davies English Patent No. 2416 of 1854, and do you understand the contrivance described therein and represented in the drawings thereof?

A. I have examined the exhibit referred to in the question and believe I understand the contrivance described in said exhibit and represented in the drawings thereof.

Q. 8. Have you examined and do you understand Defendants' Exhibit Smith English Patent, which is No. 12375 of 1848, and do you understand the contrivances and improvements described therein and represented in the drawings thereof?

A. I have several times carefully examined a copy of the English patent referred to in the question, and have now examined that copy thereof contained in the exhibit referred to in the question, and believe I understand the various contrivances and improvements described in said exhibit and represented in the drawings making part thereof.

Q. 9. State what is the device or structure you find described and shown in the Davies English patent No. 2416 of 1854, and what is the operation thereof.

A. I find described in that patent a modification of the old and well-known roller-blind which was, to my knowledge, used long before the date of that patent in connection with windows of carriages. These blinds, so far as I know of them, were applicable only to straight windows, or, in other words, to windows in which the glass was a plane surface. During the last twenty or twenty-five years, to my knowledge, carriages have come in fashion in which the window-glass was curved so that horizontal lines drawn on the same would be curved lines, and the object of the invention is to so change the old-fashioned carriage-blind that it may be applicable to these curved windows. In the old-fashioned carriage-blind the axis of the blind was straight or rectilinear, as it is in shade-rollers at the present day.
89 Davies substitutes for this straight axis or axle an axle having the same curve in it as the curve of the window-glass. Old fashioned coach-blinds and roller-shades had a hollow cylinder surrounding the coil-spring, which cylinder was rigid or non-elastic, and the axis of which was a straight line. Davies uses, instead of this rigid or non-elastic cylinder, a yielding or elastic cylinder made of India rubber. This cylinder is located, as usual, so as to surround the coil-spring, and, owing to the fact that the coil-spring is coiled around a curved axle, the yielding or elastic cylinder also becomes curved longitudinally, the curve thereof being the same as that of the window-glass. Davies states, in substance, that the ends of the axle are to be secured in brackets, and that the apparatus is to be provided "with the usual pawl and ratchet and the trigger or detent C," from which I understand that the shade is to have such a spring-click, such a ratchet-wheel and pawl, and such a trigger as were usually employed in carriage-blinds prior to the date of Davies' invention. At any rate, he claims nothing new with respect to the ratchet, pawl, or detent, but states that he desires "it to be distinctly understood that the new and peculiar feature of my said improvement in roller-blinds consists in the employment of a flexible, elastic covering tube in place of the rigid metal tube which encloses the spring of an ordinary straight roller-blind." There is no drawing in the patent of the ratchet-wheel and pawl from which any information as to their construction can be derived, the patentee apparently relying upon his reference to the old forms of ratchet and pawl as a sufficient description.

Q. 10. From your understanding of that Davies English patent, what keeps the click in contact with the ratchet, and how is that click released from the ratchet in the operation of the roller?

A. The click or pawl, as I understand it, is to be kept in contact with the ratchet in the usual way, namely, by means of a spring, and is to be released from the ratchet by pressing upon the
90 triggers C, or pulling upon a cord passing through a hole which

C is represented as provided with—in the usual way that the release of the pawl is effected in old-fashioned carriage blinds or shades.

Q. 11. State what are the devices or improvements you find described and set forth in Defendants' Exhibit Smith English Patent 12375 of 1848, and state what is the operation of such devices or improvements.

A. The first device that I will refer to is a torsion-spring, which is to be used in place of the ordinary coil-spring, for shutting doors and rolling up window-shades. This spring he describes as made of vulcanized India rubber, the rubber being a long strip which is bent upon itself once or more, so that when the strip as a whole is twisted the parts thereof shall occupy the same position as are occupied by the strands of a rope. If a piece of ordinary rope be twisted in the direction of the twist, and after it has been made, it will, when dropped from the hands, untwist itself to about the same extent to which it had been twisted. The spring of this Smith patent acts in the same way, but is capable of being twisted and reacting to a much greater degree than a rope is, because the strands are made of India rubber. These torsion-springs are clearly shown in Figs. 4 and 10 of the drawings of the patent, and there is a statement in the patent that they may be made of strips of metal, metal wire, whalebone, cat-gut, etc. A second improvement which he refers to is one on the old-fashioned shade-roller, made without either a coiled or a torsion spring, and revolved in either direction by means of an endless band passing over a pulley upon the roller and underneath another pulley attached to the window-casing. This improvement consists in attaching a supplementary cord, F, to the ordinary endless band, so that the band may be caused to traverse by pulling upon this supplementary, tasselled cord instead of the endless 91 band itself. This improvement is represented in Fig. 2 of the drawing, and the patent states what are the advantages of this improvement.

This roller has not, as I before stated, a coil-spring or any equivalent therefor, or a pawl or a ratchet-wheel, and needs none of them.

A third improvement described in the patent—

Adjourned to Wednesday, Oct. 25th, 1882, at 10.30 a. m.

New York, Wednesday, *October, 25th*, 1882.

Met pursuant to adjournment.

Present: Counsel for respective parties.

Direct examination of Henry B. Renwick continued:

Is a new way of releasing the pawl and causing it to engage with the ratchet-wheel of an ordinary shade-roller. In carrying out this improvement he uses a ratchet-wheel of the ordinary construction applied to the end of the spring-roller, and a pawl or detent, much of the usual construction, save that it is weighted at its ends, or, more properly, so shaped that a portion of the pawl itself serves as a weight to cause it to engage with the teeth of the ratchet-wheel

when the pawl is relieved from the preponderating weight of a cord and tassel attached to the trigger. With the ordinary click or pawl, which is represented at the drawing 5A of the Smith patent, the point of the pawl is always bearing upon the ratchet-wheel when the shade is being pulled down, thereby causing a clicking noise as the pawl falls into the depressions during the time the shade is being pulled down, and Smith states that the object of this improvement which I am now speaking about is to make the operation of the contrivance perfectly noiseless. This improvement which I am now speaking of is described in the patent as the first improvement, and
can be understood by references to Figs. 1, 3, and 4 of the
92 drawing. The roller with its springs, axes, etc., is shown in
Figs. 3 and 4, and the shape of the ratchet-wheel, pawl, and detent in Fig. 1. The description is meagre, but is clear enough to me, and in carrying out this mode of making the operation noiseless the pawl or detent and trigger are to be shaped as in Fig. 1. So, also, is the ratchet-wheel, and a tassel is to be attached to a string which goes through a hole in the trigger, the string and tassel together being of sufficient weight to more than counterbalance the pawl and its crooked tail, so that when the pawl is not affected by the torsion-spring (as I will hereafter endeavor to explain) the weight of the cord and tassel will hold the pawl up in the air and out of contact with the ratchet-wheel, so that, in the words of the patent, "When it is desired to cause the pawl to catch into the teeth of the ratchet it is only necessary to relieve it of part of the weight of the cord and tassel by holding it up by the hand."

In this contrivance the ratchet-wheel is clearly shown in Fig. 1 to be the ordinary ratchet-wheel, the backs of the teeth being formed in such manner that the pawl will commence to be lifted as soon as the shade has commenced to be drawn down, and will continue to be lifted until the straight side of the next succeeding tooth comes under its point, and so that the pawl will commence to fall towards the centre of the ratchet-wheel the instant that the straight side of the tooth escapes from it, thus insuring the engagement of the pawl when the tassel is lifted, whether the rotation of the roller under the influence of the spring be fast or slow. In the operation of this contrivance, supposing the roller to be at rest and the pawl in place against a tooth of the ratchet-wheel, then the pawl will be held in this its locking position, against the force of the preponderating weight of the tassel by the torsion-spring which forces the straight side of the tooth against the pawl, thereby causing an amount of friction between them
which will not be overcome by the weight of the tassel. If now
93 we desire to pull the shade down the pawl will be tripped by the
weight of the cord and tassel as soon as the pulling down of the shade separates the straight side of the ratchet-tooth from the end of the pawl; and the pawl will remain up in the air, not grating and clicking upon the ratchet-wheel teeth as they move under it. When the shade has been pulled down far enough the other hand of the operator must be applied under the tassel, lifting it and relieving the trigger, and consequently the pawl, of its weight. The crooked weighted tail of the pawl will then cause the pawl to fall

and engage with one of the teeth of the ratchet-wheel, and it will be held in this engagement when the hand of the operator is removed from the tassel by the action of the torsion-spring, as before stated. When it is desired to run the shade up, the pawl must be thrown out of engagement either by pulling downwards on the string and tassel or by pulling the shade a little downwards, so as to bring the tooth and pawl out of contact, and in either case the pawl will remain out of contact with the ratchet-wheel, being held out of contact by the weight of the tassel and cord until the hand is applied to lift the tassel and cord, thus permitting the weighted tail of the pawl to cause the engagement of the pawl proper with the ratchet-wheel. The shape of the pawl, of its weighted tail, of its trigger, and of the ratchet-wheel, necessary in order that they may operate as I have just described, are clearly shown in Fig. 1 of the drawing of the Smith patent.

The Smith patent also describes and represents, at Fig. *5a*, a common ratchet-wheel, spring-click, trigger, and cord such as I have before referred to as in common use years ago in carriage roller-blinds, and I understand from the patent, although it is not clearly expressed therein, that he intends to use, in connection with the rollers and their accessories, shown in Figs. 3 and 4, either the ordinary click and its accessories, represented in Fig. 5^A, or the weighted pawl and its accessories shown in Fig. 1.

94 Q. 12. According to the Smith English patent, what must be the weight of the cord and tassel attached to the outer end of the pawl, as shown in Fig. 1, as compared with the weight of the short or inner end of the pawl?

A. The pawl is pivoted, as clearly shown in Fig. 1, and is weighted by means of a crooked tail, the pawl itself being what I understand he refers to as "the inner end of the pawl." What I have called the trigger is the piece which has a hole in it for the reception of the cord, and this trigger is made in one piece with the pawl and weight; and the patent, as I understand it, calls for a cord and tassel so heavy that when the pawl is disengaged from the ratchet-teeth the weight of the cord and tassel will hold the pawl up in the air and out of contact with the ratchet-wheel. This is clearly expressed in the patent, where it states, in substance, that in order to cause the pawl to catch in the teeth of the ratchet wheel it must be relieved of part of the weight of the cord and tassel; and this direction as to the weight of the cord and tassel is further confirmed by the statement in the patent that "the operation is thus perfectly noiseless."

If the weight of the cord and tassel were not sufficient to hold the pawl out of contact with the ratchet-wheel, then the operation would not be noiseless; but, on the contrary, just as noisy as it is with the ordinary spring-click.

Q. 13. State whether the form and combination of the pawl and ratchet, as shown in Fig. 1 of the Smith English patent, is such as to permit a full and complete engagement of the said pawl and ratchet, or to prevent in any way such full engagement.

A. The forms of the pawl and ratchet-wheel are such that when the pawl is permitted to drop by raising the tassel it will engage itself to the full depth of the tooth of the ratchet-wheel and of the acting face of the pawl.

95 Q. 14. Dr. Hagan, the defendants' expert, in testifying as to the Smith English patent, has quoted certain parts of said patent, which are found on pp. 22, 23, and 24 of the defendants' record, and on page 24 he says: "From the quotations that I have made it appears that the curtain-roller was operated to unroll the curtain against the torsional spring, and the measure of its motion was regulated by means of a ratcheted hub that moved with the roller, and pawl constructed to operate in a stationary cap or disc, so that when the curtain was moved rapidly the pawl would overrun the ratchet so as not to engage with it, but, when moved slowly, the pawl would drop into the ratcheted hub, engage with it, and so stop the revolution of the roller." And on page 26 he also says as to the said patent: "I find, however, in the Smith patent that in connection with a hollow roller a torsional spring had been used so that the curtain would be unrolled against its torsion and rolled up with its torsion, and the measure of the rotation of the roller to so act had been regulated by a pawl and ratcheted hub, which became active or inactive, to arrest the rolling up of the roller or its unrolling by the relative velocity with which this was accomplished. When moved slowly the pawl would descend into the ratcheted hub and arrest the revolution; when moved rapidly the pawl would skip the ratchet so as not to engage with it." Please read the parts of the Smith patent quoted by said expert, and state whether from those parts, or from any other parts of said patent, in your opinion, the roller, ratchet, and pawl described in the Smith patent can have or do have any operation or mode of operation such as is stated by defendants' expert, and give your reasons for any opinion you may express.

A. I understand the mode of operation stated in these quotations by defendants' expert to be the same as the mode of operation described in the original patent to Hartshorn, No. 44624, and the reissue, No. 2756, which were referred to by me in my third
96 answer, and there is not the slightest warrant, either in the specification or drawings of Smith, for stating that the Smith patent describes any contrivance having any such mode of operation. It is true that in the Smith patent the pawl is mounted upon a stationary pivot, whether it be made in the form shown in Fig. 1 or in Fig. 5*a*, and that the ratchet-wheel or ratcheted hub is attached to the roller so that it will revolve with it. I have already described the operation of the contrivance shown in Fig. 1, and stated that the pawl is kept out of connection and contact with the ratchet-wheel whenever the latter is moved by the torsion spring and until the tassel is lifted so as to permit the pawl to engage. It is evident, therefore, that the speed at which the roller revolves has not the slightest effect upon the question as to whether the pawl will or will not engage with the ratchet-wheel. I will now suppose that the tassel is removed from this contrivance (contrary to the directions of Smith), in which case the weighted end of the pawl would always hold the pawl itself in engagement with the ratchet-wheel. In that

case the pawl would engage with every tooth, whether the roller was going fast or slow; and this is owing to the peculiar but usual shape of the pawl and the ratchet-wheel, the latter being so formed, as I have before stated, that the pawl can commence to descend the instant that the straight face of a tooth has passed under it, the pawl falling during the whole time that the distance between the straight sides of two teeth is passing under it. In order that the mode of operation referred to by the defendants' expert in the quotations made in the question should take place practically, it would be necessary not only to remove the weighted cord and tassel, but also to alter the shape of the pawl and ratchet shown in Smith's patent, Fig. 1, until they conform substantially with the shape shown in the drawings of the Hartshorn patent and reissue before referred to, especially in Fig. 3 thereof. By noticing these drawings it will be perceived that the ratchet-wheel is a part of a
97 circle between the teeth thereof, instead of being part of an eccentric, as in Fig. 1 of Smith, and that the depression which receives the pawl is in Hartshorn of only about the width of the pawl, while in Smith the depression extends from the straight side of one tooth to the straight side of the next tooth in succession. In consequence of these changes in structure, the Hartshorn pawl, after leaving one tooth, is held up by the circular part of the ratchet-wheel, and does not commence to fall until the depression *c* gets under the pawl; and if the roller is going fast, the pawl has no time to fall into the depression, the pawl being held up by the ratchet-wheel until the depression gets under it. In Smith's contrivance, on the contrary, the pawl commences to fall as soon as it has reached its highest elevation, instead of being held up as in Hartshorn, and has plenty of time to get below the top of the next succeeding tooth, whether the ratchet-wheel move fast or slow. In the contrivance shown in Fig. 5*a*, of the Smith patent, the ratchet-wheel is of the same shape as that shown in Fig. 1 in that patent, and will operate in the same way upon the pawl, which is held down upon it by a spring. Now, so far from the statement of the defendants' expert being true in relation to this device, it is easy to be seen that the roller will not revolve under the influence of the spring to pull the shade up, either fast or slow, unless the pawl is held out of contact with the ratchet-wheel teeth by pulling upon the cord which is attached to the trigger of the pawl. Fig. 5*a* of Smith represents precisely the construction of the roller upon which Hartshorn made his improvement which enabled him to dispense with the trigger and cord, and to manipulate the roller up and down and cause it to be held at any desired point by means of one hand applied to the bottom of the shade.

Recess taken till 2.15 p. m.

After recess.

98 Q. 15. Exmine the roller marked Defendants' Exhibit Model Smith English Patent and compare the same with the Exhibit Smith English Patent, and state whether, in your opinion, said model is constructed in accordance with said patent; and, if said

model differs in any respect from the roller described and shown in said patent, point out particularly wherein said model differs in construction from the structure shown in said patent, and state what is the effect of such differences in the construction of the roller, referring in your answer, if need be, to the drawing shown you, and give your reasons for any opinion you may express.

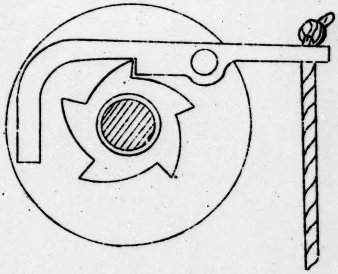
The drawing referred to is marked "Complainant's Exhibit Drawing of Pawls and Ratchets, Oct. 25, 1882." S. N. W., ex'r.

(Here follows diagram marked p. 99.)

A. The model referred to in the Q. is not a correct, but is manifestly and plainly an incorrect or false, representation of the apparatus represented in Figs. 1, 2, and 4 of the Smith patent, and described in the specification thereof. The first difference that is apparent on examination of the model is that it is not provided with a string and tassel heavy enough to counterbalance the weighted end of the pawl, and hold the pawl out of engagement and contact with the ratchet-wheel in the manner which I have described in former answers. The second thing is that the shape of the ratchet-wheel has been altered from that shown in the drawing, so as to make it conform substantially with the shape of the ratchet-wheel shown in the drawing of the Hartshorn patent referred to in my last answer, the effect of this change being to furnish a concentric portion of the ratchet-wheel between the teeth thereof, thereby holding the pawl up in order to produce such effects as are produced by the Hartshorn contrivance. In the drawing referred to in the Q. Fig. A is a tracing from Fig. 1 of the Smith patent; Fig. B is a correct drawing of the ratchet-wheel, weighted pawl, and 100 & 101 trigger of "Defendants' Exhibit Model Smith English Patent." A comparison of the ratchet-wheels in Figs. A and B will show how the structure of the model differs from that of the Smith patent, and I have already explained to some extent what effect is produced by this difference of structure. Turning now again to the model, it will be perceived by inspection that the weighted tail of the pawl in the model is entirely different in shape from the corresponding weighted tail of the Smith patent, and this comparison may easily be made by a reference to the drawing where the tail of defendants' model is shown in Fig. B and the tail of the Smith patent in Fig. A. This change in the shape of the tail is not a mere change in form, but a change which secures results. By bending the tail around, as shown in Fig. B, it rests when the pawl is in its lowest possible position upon the ratchet-wheel, and prevents the pawl from engaging fully with the ratchet-tooth, which fact will clearly appear from an examination of Fig. B. Further, this bending around of the tail of the pawl so that a portion of it comes nearly under the pivot of the pawl diminishes the effective weight of the tail, which is operative in causing the engagement of the pawl. The pawl will fall, therefor, less swiftly and forcibly than the pawl of the Smith patent. In consequence of this change of shape of the ratchet-wheel and of the pawl, both of which in fact amount

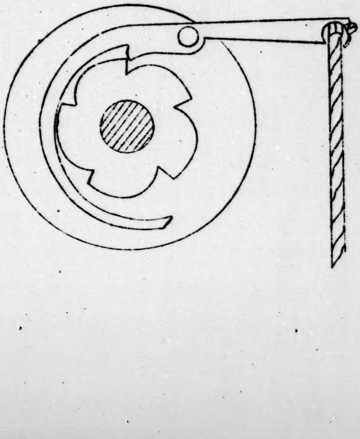
Hartshorne V. Saginaw Barrel Co. et. al.
Complts, Exh Drawing of Pawls & Ratchets
Oct 25 1882
S. N. W. Exr.

Fig A.



No 310
Hartshorn
vs.
Barrel Co et al } p. 99

Fig B.



to structural changes, and owing to the absence in the model of a string and tassel sufficient in weight to hold the pawl up in the air and out of contact with the ratchet-wheel, the model will operate in the manner described by Dr. Hagan, in the manner in which the original Hartshorn invention operates, and in a manner in which the contrivance described in the Smith patent will not and cannot operate.

I am informed and believe that the Defendants' Exhibit Model Smith English Patent contains within the roller a common coiled spring performing the duty of the torsion-spring described in Smith's patent. 102 I do not consider this difference between the model and the patent material, because the torsion-spring and the coiled spring perform precisely the same duty in the combination of Smith. There is another difference between the model and the patent which is of somewhat greater importance. In the patent the spindle D^a is described as terminating in a square piece which fits into a corresponding aperture in the bearing-bracket G^1. This description calls for a quadrangular hole in the bracket completely enclosing the spindle and preventing the removal of the shade-roller and its accessories as a whole, unless the bracket G^1 is unscrewed and removed from the window-casing. The model shows the quadrangular end of the spindle as supported in an open slot, open at top only, so that it holds the roller securely while in use and permits of its easy removal for the purpose, among others, of winding up the spring. This slot in the model has, moreover, a projection on the top at one side and a corresponding recession on the other side, thus permitting the easy entrance of the square part of the spindle and preventing it from jumping out or being accidently knocked out of place. There is no warrant in the Smith patent for the open top slot for the reception of the square part of the spindle or for the projection or corresponding depression on the sides of the top thereof.

I notice also that the curtain of the Defendants' Exhibit Model Smith English Patent is provided with a slat which is weighted by a piece of sheet lead inserted therein. Shade-rollers before the date of Smith's patent usually had a slat in the bottom thereof, but not a weighted slat to my knowledge, and there is no description or representation in the Smith drawing of a weighted slat. I am unable to state positively that this weighting of the slat performs any real duty in the contrivance other than that of keeping the curtain straight, although it may possibly have been introduced therein for the purpose of rendering more certainly operative the very slight engagement which the pawl in the model has with the 103 ratchet-wheel, the weight tending to a certain extent to neutralize the force of the coiled spring, and prevent it from throwing the pawl out of gear after the contrivance has become a little warm

Adjourned to Thursday, October 26th, 1882, at 10.30 a. m.

THURSDAY, *October* 26, '82.

Present: Counsel as before.

The examination of the witness RENWICK resumed:

Q. 16. Look further at the model marked "Defendants' Exhibit Model Smith English Patent," and compare the ratchet and pawl in said model with the ratchet and pawl shown in figure 1 of the Smith English patent, and state how such pawl and ratchet in the model compare in extent of engagement of the two with figure 1 in the Smith patent?

A. The ratchet and pawl in figure 1 of the Smith patent are so shaped and combined with each other, as I think I said before, that the acting face of the pawl can engage throughout its whole depth with the straight face of the ratchet-teeth, so that the pawl will hold the ratchet firmly and safely against any effort of the torsion-spring to turn the roller. The pawl in the model, owing to the peculiar shape of its tail, can engage through but a very slight portion of the depth of its acting face with the ratchet-teeth, and the lower part of the acting face of the pawl appears to be slightly bevel, although I am not positively certain of this; this beveling operating to cause the pawl to fly up when the ratchet-wheel revolves rapidly under the influence of the torsion-spring.

Q. 17. Look at the roller now shown you, and which is marked Complainant's Exhibit Smith Roller, 1, and compare the same with the Smith patent, and particularly compare the pawl and ratchet-wheel
104 in said model with the pawl and ratchet-wheel shown in figure 1 of the Smith patent, and state whether or not said model in construction is like or differs from the construction described and shown in the Smith patent, and give your reasons for any opinion you may express.

Complainant's counsel puts in evidence the roller marked "Complainant's Exhibit Smith Roller, 1," and the frame upon which the same is hung, to illustrate more clearly the operation thereof.

A. I have frequently examined the model referred to in the question and believe it to be a substantially correct representation of the roller as a whole as described in Smith's patent, and represented in the drawings, figures 1, 3, and 4, thereof. The roller proper of the model has a longer tin cylinder and a shorter wooden plug in proportion than the roller shown in the drawings of Smith, but this is a matter of degree entirely immaterial, and not affecting in any way the operation of the contrivance. The roller in the model is provided with a torsion-spring made of vulcanized India rubber, and operating as described in the Smith patent. The ratchet-wheel and pawl, with its trigger, as I have called it, and with its weighted tail, are in the model identical even in form with those described and represented in the Smith patent, and are so combined that the acting face of the pawl and the tooth will engage to the same extent as they do in the patent. The trigger in the model is provided with a cord and tassel sufficiently heavy to overbalance the weight of the pawl and its tail, so that the pawl will be held up in the air when it is disengaged from the ratchet-teeth, thus complying with Smith's description; and in the model it is, in the words of Smith's patent, only necessary to relieve the pawl of the part of the weight of the cord and tassel, by holding it up by the hand when it is desired to 105 cause the pawl to catch into the teeth of the ratchet. Further, in this model the operation of the contrivance, both in rolling up and unrolling the shade, is, in the words of Smith, "perfectly noiseless;" and is so because the pawl is held out of contact with the ratchet-wheel, by means of the cord and tassel, when the shade is either being raised or lowered. In this model, moreover, the slat at the bottom of the shade is not weighted, and the square or quadrangular end of the spindle *Da* enters into a corresponding aperture in the bearing-bracket in the manner described in the Smith patent, removal of the roller as a whole being thereby prevented until the bracket is unscrewed from the window-casing. Examination of the torsion-spring in this model through the hole made for that purpose in the tin cylinder shows that it acts in the manner which I have described in the previous answer. Further, in this model the torsion-spring holds the face of the ratchet-tooth against the face of the pawl when the two are engaged with sufficient force to prevent the weight of the cord and tassel pulling the pawl out of engagement with its tooth.

Q. 18. In view of the state of the art, as appearing from the English patent of Smith of 1848 and the English patent of Davies of 1854 and the Hartshorn patent 44624, what, in your opinion, is the invention described and shown in the David patent No. 69189, and covered by the first claim thereof, assuming the David invention to be prior in point of time to the inventions described in the Hartshorn and Campbell patents of 1867, and give your reasons for any opinion you may express?

A. Leaving out of consideration the roller described in the Smith patent, which has no torsion or coil spring, and is rolled or unrolled by means of an endless band or cord, and has therefore no bearing upon the question, both the Smith patent and the English patent of Davies describe shade-rollers provided with torsion or coil springs so combined with the roller as to tend always to roll 106 the shade around it. With these rollers there was combined a ratchet-wheel, attached to and revolving with the roller, and a pawl, actuated by gravity, or by means of a spring, the pawl being on a stationary pivot, and so combined with the ratchet-wheel that when not prevented by some extraneous force it would engage with the teeth thereof. In order to disengage the pawl from the teeth the pawl was provided with what I have heretofore called a trigger, which trigger had usually, if not always, a cord attached to it, and by pulling down the cord or pushing down the end of the trigger the pawl was released from its engagement with the ratchet-wheel, and the roller permitted to revolve freely under the influence of the torsion or coil spring. Rollers having these characteristics, and operating in this way, were know to me long before the date of the Davies patent, and were in common use as carriage-shades. In manipulating these rollers two hands were necessary, one to hold

the pawl out of contact while the roller was rolling up, and the other to check the roller when the shade got to the desired height. Hartshorn contrived a new ratchet-wheel and pawl, and combined them together in such manner that the pawl would not engage when the roller was moving rapidly, and would engage when the roller was moving slowly. He was thereby enabled to dispense with the trigger and its cord, and the roller could be manipulated and the shade placed at any desired height by the use of one hand only, this hand being applied either to the shade or to the slat usually found in the bottom of shades or to a cord attached thereto. Hartshorn still used a ratchet-wheel, attached to and revolving with the roller, and a pawl, with a stationary pivot, the pawl being pivoted on the stationary bearing of the roller. As I have said before, Hartshorn's invention required a peculiar shape and combination of the ratchet and pawl,
and, as the pawl always rested upon the ratchet, and some-
107 times dropped a little way into the notch, and was knocked
out again during the rapid revolution of the roller, the contrivance made some noise, and required a tolerably exact construction of the pawl and ratchet-wheel. This was the state of the art, as I understand it, at the time of David's invention.

An adjournment was here taken until 2 p. m.

After recess.

David shifted the ratchet-wheel from the roller and made the ratchet-wheel or its equivalent stationary; it no longer revolved with the rollers as it did before. He then applied the pawl to the roller so that the pivot of the pawl became a revolving pivot, and the pawl revolved around and around a stationary ratchet-wheel. In consequence of this new location and combination of the parts, the pawl, when the roller was in rapid revolution, was thrown by centrifugal force away from the stationary ratchet-wheel, was kept away from contact with the ratchet-wheel, so that there was no clicking noise during the ascent of the shade, and fell into engagement with the teeth of the ratchet-wheel when the roller revolved so slowly that centrifugal force no longer operated to hold the pawl out of contact with the ratchet. David says in his patent, as follows: "The movement of the end of the arm or detent (which is the pawl) is towards and away from the axis of the roller, centrifugal action, when the roller is rapidly turned, sending the detent outward, at which time it will pass over the elevated side *j* of the journal *f*." Now, this journal-box *f* is the ratchet-wheel. It is true that it is a ratchet-wheel with only one tooth, but it is a ratchet-wheel which will permit the pawl to pass freely over it when the shade is drawn down, either rapidly or slowly, and it will catch the pawl and arrest the roller, and consequently the shade, whenever the latter is being moved up under the influence of the spring so slowly that centrifugal force will not
hold the pawl out of contact with the ratchet. The patent
108 goes on to state "when the roller is moving slowly, or is in a
state of rest, the action of gravity brings the detent towards the centre of the roller at these times when the detent is above the centre, and at such times said detent engages the said part *j* and

the revolution of the roller is arrested." In the next succeeding paragraph, in the second column of the first page of the Patent Office copy of this David patent, the structure and mode of operation of the contrivance is further set forth.

Now, it is true that in the David patent that the pawl or detent is so pivoted that it swings in and out from the centre of the roller in planes passing through the axis of the roller; but there is nothing in the patent or in the first claim which limits the invention to any particular position of the pivot, or to any pivot to support the pawl, so long as the pawl is so combined with the roller that it will revolve with it, so that when the roller is revolved rapidly the acting end of the pawl or detent shall be thrown by centrifugal force away from the axis of the roller, and consequently away from the stationary ratchet-wheel or its equivalent, and will engage with such ratchet-wheel or its equivalent when the roller is moving slowly or in a state of rest. Now, by means of the roller of David, as a whole, the manipulation of the shade by one hand can be effected in the same manner as it was by Hartshorn. But this is effected without reference to the special shape of the ratchet and pawl, because David invented and used the centrifugal pawl, and it can be effected without noise, because the pawl, on account of its being a centrifugal pawl, revolves out of contact with the ratchet when the roller is moving rapidly. As I understand it, David invented the combination with the roller revolved by a torsion or coil spring of a pawl mounted upon and revolving with the roller, and a stationary ratchet or its equivalent, irrespective of the precise form either of the ratchet
or the pawl, or of the pivoting of the pawl, so long as the parts
109 were combined in such manner that the pawl would be thrown
out of contact with the ratchet by centrifugal force when the
roller revolved rapidly, and would engage with the ratchet when the roller moved slowly, or came to rest; and I understand that to be the invention covered by the first claim of the David patent.

Q. 19. Please examine the "Exhibit Saginaw Barrel Company's Roller, No. 1," and state whether, in your opinion, such exhibit contains and embodies in its construction and operation the invention described and claimed in the first claim of the patent, Complainant's Exhibit David Patent, and give your reasons for any opinion you may express; and, if desired by you, you may refer to another model, marked Saginaw Barrel Company Roller, 1*a*, which is admitted to be, so far as it goes, a duplicate of the model "Saginaw Barrel Company Roller, No. 1."

Objected to by defendants' counsel as not being proper rebutting testimony, but such testimony as should have been taken in chief.

Complainant's counsel insists that the last question is not objectionable on the grounds or for the reasons mentioned by defendants' counsel, but is admissible under the decisions of the courts in connection with the question last put to the witness.

Adjourned to Friday, October 27th, 1882, at 10.30 a. m.

NEW YORK, *October 27th*, 1882.

Met pursuant to adjournment.
Present: Counsel as before.

Direct examination of HENRY B. RENWICK continued:

Question 19 withdrawn.

110 20 Q. In view of the state of the art, as appearing from the English patents of Smith and Davies, the Hartshorn patent 44624, the David patent 69189, what, in your opinion, is the invention described and shown in the patent Campbell reissue 7367, and covered by the first claim thereof, and give your reasons for any opinion you may express?

A. I have said before that in the David patent the ratchet-wheel, or substitute therefor, was stationary, and that the pawl revolved with the roller; but this ratchet of David's was formed upon or made a part with the stationary bearing of the roller, which is screwed fast to the window-jamb. Therefore, when the roller as a whole was taken out of its bearings (one of the bearings being open at top so as to enable this to be effected), there was nothing to hold the spring in its coiled position, and it would uncoil itself and run down to a certain extent, necessitating a winding-up of the spring and the holding of it, wound up, by the hands of the operator, until the roller was again replaced in its bearings. This is not an easy operation, because there is nothing to hold the spring-coil as it is coiled up, nor to hold it coiled during the insertion of the shade into the bearer or bracket. In order to remedy this defect Campbell made the ratchet-wheel or its equivalent in one piece with the stationary or non-revolving part of the roller axis. Campbell's ratchet-wheel, as before stated, was stationary like David's, but Campbell made it stationary on the roller-spindle instead of the shade bearing, which is fastened to the window-casing, and his pawls were centrifugal-acting pawls, in so far like that of David. The stationary ratchet and the centrifugal pawls of Campbell therefore occupy the same relative position when the shade is lifted out of its bearings as when the shade is in its bearings, while on the contrary, in David, the two separated as soon as the roller was removed from its bearings. In consequence of this construction of Campbell's the pawl and ratchet-wheel would re-
111 main in engagement when the roller was taken out of its bearing, and the spring would remain wound up, would not run down. Now, it is true that in Campbell the ratchet is represented as a flattened or notched part of the spindle, and that the centrifugal pawls or detents are sliding pawls and not pivoted pawls; but they are pawls so mounted on a roller that they will engage with the ratchet by the force of gravity while the roller is revolving slowly, and will be held out of contact with the ratchet by centrifugal force when the roller is revolving rapidly. And I do not think that the first claim of the Campbell reissue is limited to any special form or kind of pawl or to any particular kind of ratchet, so long as the two are mounted and combined with each other, as I have before

described, and I think that the first claim covers the combination of a pawl or detent arranged on the roller which carries the notched spindle or ratchet, whereby the roller can be moved up and down by a single hand, and the spring remain locked or in a wound-up condition when the roller, as a whole, is removed from its bearings.

21 Q. In view of the state of the art, as appearing from the English patents of Smith and Davies, the David patent 69189, the Campbell reissue 7367, what, in your opinion, is the invention described in the patent Hartshorn reissue 7370 and claimed therein, and give your reasons for any opinion you may express?

A. In view of these former patents the invention of Hartshorn must be limited merely to details of construction, because all the functions of his roller are performed by the roller of Campbell, and the roller of Hartshorn has a ratchet, or its equivalent, on the stationary part of the spindle, a pawl mounted upon the roller and revolving with it, and held out of contact with the ratchet by centrifugal force when the roller revolves rapidly; all these parts being so combined that the spring will be held locked and wound up when the roller, as a whole, is removed from its bearings. Instead
112 of the sliding pawl of Campbell mounted and moving in a
chamber in one of the heads of the hollow roller Hartshorn uses a swinging or pivoted pawl mounted on the inside of that head, said pawls moving in a plane perpendicular to the axis of the roller and the pawl operating to hold the ratchet by a face which is nearer the pivot than the end of the pawl. And in consequence of this arrangement of the pawl he was enabled to put the ratchet inside the end cap of the roller, thus securing a good outer bearing on which the end cap might revolve, and enclosing the whole mechanism inside of the end cap, so that it is closed to the entrance of dirt and cannot well be hurt or injured accidentally. He states in his patent that the pawl is a hinged or pivoted pawl, and that the hub D, which is the ratchet, is keyed upon the journal, and the drawing shows that both pawl and the ratchet are inside the head of the roller; and I understand that the claim of the Hartshorn reissue is limited to the precise construction and arrangement of parts as set forth in this answer. It is, perhaps, well to state that the disclaimer to this reissue stated in substance that he does not claim the arrangement of the pawl and ratchet which is described in the Campbell patent, and which Hartshorn admits to have been previously invented by Campbell.

22 Q. The defendants' expert calls the springs found in the various patents put in evidence in this cause and found in the defendants' roller torsion-springs; please state what you understand to be a torsion-spring, and whether the springs in the exhibits in this cause, except the English Smith patent, are torsion-springs, as you understand such a spring.

A. If a thin piece of metal, like a watch-spring straightened out, be fastened at one end, and the other end be seized by a pincers and
twisted, so that the piece of metal is wound into a screw shape,
113 or more precisely into the shape of the body of an ordinary
auger, then this spring will unwind itself when the pincers

is removed, and will be and act as a torsion-spring. If a piece of India rubber be twisted in the same way it will act as and be a torsion-spring. The springs described in the English patent to Smith and the spring in "Complainant's Exhibit Smith's Roller, 1," are torsion springs. The springs in all the other patents and exhibits are coiled springs, and act by coiling and uncoiling in the same manner as the mainspring of an ordinary watch, although the latter is a volute or helical spring and the former are spiral springs. When a shade-roller is pulled down an additional turn is put into the coil at each revolution of the roller, and the spring, instead of acting like the spring of a watch, acts in the same way, though different in degree, as a straight spring held in horizontal position by a support at one end and loaded at the other end. When a load is applied to such a spring the particles of metal are forced into more intimate union on the under side of the spring and stretched apart on the upper; and so in a volute or a coil or spiral spring. The particles of metal on the inside of the coil are compressed as the spring is wound up, while the particles on the outside of the coil are stretched apart. In a shade-roller both torsion and coil springs can be used so that either of them will operate to turn the roller and wind up the shade.

23 Q. Please examine the Campbell reissue 7367 and the original thereof, 69176, and state whether you find in the former any different inventions described from that which is shown and described in the latter.

A. The structures represented in the drawings of the two patents referred to are precisely the same, and the description of them, although different in language, is also the same. It is stated in the reissue that the bolts or pins act as pawls or detents, and that same statement is found, in substance, in the original, where it says 114 that the ends or points of the pins or bolts "overlap the flattened sides of the shaft D, so as to bind said shaft and prevent its revolution." The notched shaft or spindle of the original patent is referred to in the reissue as a ratchet, while it is not called by such a name in the original patent, but it is also called in the reissue the shaft, a spindle, D, "flattened or notched, as shown in Fig. 2," and the "flattened or notched shaft or spindle." It is evident from the description of the original patent and from an examination of the drawings thereof, even without reference to the description, that this flattened or notched shaft is, in fact, a ratchet; and the giving to it in the reissue of the name which properly characterizes its operation does not change substantially the description of the reissue from the description of the original patent. The original patent does not state that the spring will be locked and prevented from uncoiling when the roller is removed from its bearings; but when a roller is constructed in accordance with the description of the original patent it would be a roller which would lock the spring when the roller as a whole was lifted out of the "jaws of the bracket E" (the words being quoted from the original patent); and I do not think that the description in the reissue that the contrivance, as a whole, will operate to lock the spring, is a departure from the invention described in the original patent. It is a mere statement in words of the mode of operation of the structure of the original patent.

24 Q. Please examine the patent Hartshorn reissue 7370 and the original of said patent, 68502, and state whether any different invention is shown or described in the specification or drawings of said reissue from that which is described in the original patent, and in your answer examine and refer to the answer of defendants' witness, Hagan, to his 25th interrogatory.

A. As I have before stated, I have frequently examined 115 this patent and reissue, and the structures described and represented in the original patent are identical with those represented and described in the reissue thereof. The original patent has only two figures in the drawing; the reissue has an additional figure—Fig. 3; but this additional figure does not show any parts nor any combination or arrangement of parts which are not shown and described in the original patent. Figure 2 of the original and reissue are the same, except that the shade is represented as a whole shade in the original and as broken in two in the reissue. Figure 2 in the original and in the reissue represent the head or disc to which the pawl is pivoted, the notched hub or ratchet wheel, and the stationary spindle on which the roller revolves with its flattened end; and these parts are represented as if looked at from the inside of the hollow roller. Figure 3 of the reissue represents exactly the same parts, as will be apparent from comparison of the two figures, but represents them as if observed from the outside of the roller, thus causing the pawl and the ratchet which are inside the roller to be represented in dotted lines. Drawing Fig. 3 of the reissue represents nothing that is not both represented and described in the original patent. It is merely a view of the same parts from a different standpoint. It is true that the reissue refers to Fig. 1 as a section taken on the line *x x* of Fig. 2, and that there is no line, *x x*, in figure 2, while there is a line, *x x*, on figure 3. This is evidently a clerical error and is unimportant, and causes no difficulty in understanding the reissue for this reason: Because figures 2 and 3 represent the same parts in the same relative positions, and a longitudinal vertical section through one of them would be precisely the same as a longitudinal vertical section through the other of the two, the phrase "Fig. 2," in the description of the reissue, quoted by Mr. Hagan, being evidently a clerical error which should have read figure 3.

116 25 Q. The defendants' expert, Dr. Hagan, in his answer to the 30th interrogatory, says, substantially, that he very much doubts whether the arm or detent *k* of the David patent is acted upon by centrifugal force in the operation of the roller, or, in other words, whether the velocity at which the curtain could be moved is sufficient to throw out this latch (as he calls the arm or detent) by centrifugal force. State whether, in your opinion, centrifugal force in the David patent acts to throw out the arm or detent *k*, and give your reasons for any opinion you may express.

A. I have no doubt that centrifugal force does act in the David contrivance to throw out the arm or detent *k*, and that the roller would not operate at all to roll up the shade unless centrifugal force came into operation to hold the latch or detent *k* near the periphery of the roller when it is revolved rapidly, and that the velocity is sufficient for that purpose, provided the roller is not unduly checked by the hand of the operator. Inspection of the drawings at Fig. 2 thereof shows that the ratchet marked *j* is shaped like a staple, with a long and a short leg, the legs being vertical and projecting upwards from the bend of the staple, and that the detent catches upon the inside of the long leg of the staple. Under such a construction and combination of the parts the detent would catch the ratchet every time the roller made one revolution, and the shade could not be rolled up by the operation of the spring, unless the detent were carried by centrifugal force so near to the periphery of the roller that it would pass over the end of the long leg of the staple without touching it.

26 Q. Please examine the roller marked "Exhibit Saginaw Barrel Company's Roller, No. 1," and state whether, in your opinion, said exhibit contains and embodies in its construction and operation the invention described and claimed in the first claim of the David patent, 69189, and in the first claim of the Campbell reissue, 7367, and the claim in the Hartshorn reissue, 7370, referring, in 117 your answer, if you desire to do so, to a model marked "Saginaw Barrel Company's Roller, 1*a*," which is admitted by defendants' counsel to be, so far as it goes, a duplicate of the model marked Exhibit "Saginaw Barrel Company's Roller, 1," and give your reasons for any opinion you may express?

DEFENDANTS' COUNSEL: I object to the question because it is not properly rebutting testimony, but is testimony-in-chief, and should have been taken when complainants first made out *their* case.

Complainant's counsel states that under the practice obtaining in the southern district of New York, in which district this testimony is being taken, such question he believes would be admissible and and not objective for the reason stated by defendants' counsel; but complainant's counsel further says that he puts this question more particularly to show to the court that this witness is not brought in to sustain the patent in view of the state of the art when he would not testify that infringement of the patents had been committed by the defendant; but complainant's counsel further states that if defendants' counsel insists upon his objection he, complainant's counsel, will withdraw the question.

The defendants' counsel insists upon his objection.

Adjourned to Monday, October 30, at 10.30.

NEW YORK, *October* 30, 1882.

Met pursuant to adjournment.

Present: Counsel as before.

Cross-examination of HENRY B. RENWICK:

118 27 X Q. Will you look at "Defendants' Exhibit Davies English Patent," and state what kind of spring is shown and described in the drawings of that patent?

A. "A coil wire spring."

28 X Q. Could that roller be removed from the brackets without uncoiling the spring or unlocking the spring?

A. I can't tell exactly; the description is not sufficient. The statement of the patent is that each end of the axle is firmly secured in a frame or bracket, so that the roller could not be removed unless the brackets were removed, and whether the spring would then be locked or not, I cannot tell. It seems to me that it would not.

29 X Q. How long have you known of these curtains and rollers to have been used in carriages?

A. I do not ever remember having seen the Davies roller used in a carriage. The straight carriage blind-roller I have known of many years; I should say thirty or more.

30 X Q. Did you ever see, prior to Hartshorn's invention, one of these straight blinds in carriages which would roll up without pulling the trigger to the pawl, or the cord attached to the trigger.

A. No.

31 X Q. Is there anything said in the Smith English patent in regard to the weighted tassel attached to the cord of the trigger?

A. Nothing, except what I have stated or quoted before. "I effect this by weighting the short or inner end of the pawl, as shown in figure 1 of the annexed drawings, so that when it is desired to cause the pawl to catch into the teeth of the ratchet it is only necessary to relieve it of part of the weight of the cord and tassel by holding it up by the hand."

32 X Q. What is the tendency of this weight in the tassel—to hold the pawl from the ratchet or to hold it on the ratchet.

A. To hold the pawl away from the ratchet, because the
119 patent says that the trigger must be relieved of a part of the
weight of the cord and tassel in order to cause the pawl to
catch into the teeth of the ratchet.

33 X Q. What holds the pawl against the ratchet when the cord and tassel are hanging free?

A. Nothing. But after the pawl has been permitted to engage with the ratchet by lifting the tassel then the force of the torsion-spring holds the face of the ratchet so firmly against the face of the pawl that the preponderating weight of the cord and tassel is not sufficient to throw them out of engagement.

34 X Q. To release the pawl from the ratchet after the ratchet is engaged with the pawl and is held there, as you have stated in your last answer, is it not necessary to add more weight to the tassel?

A. No; because by pulling down the shade a little the face of the pawl will be brought out of contact with the straight face of the tooth of the ratchet-wheel, and as soon as this happens the weight of the cord and tassel will throw the pawl up into the air and out of contact with the ratchet-wheel; or the pawl may be disengaged by pulling down upon the cord and tassel with sufficient force to jerk the pawl out of its engagement with the tooth of the ratchet-wheel.

35 X Q. Is not this pulling down on the cord adding a weight to the cord and tassel?

A. It is equivalent to adding a weight to it; it produces the same effect as if a weight were added to it for the purpose of effecting a disengagement.

36 X Q. When the pawl is released from the ratchet by pulling down the curtain, and the tassel is raised so as to relieve the pawl of its weight, will the curtain immediately roll up?

A. No; because the pawl will catch to the next or the same ratchet-tooth in that case. But if the tassel be not relieved of its weight by the hand then the curtain will roll up, because the pawl will be held out of engagement by the weight of the cord and tassel.

120 & 121 37 X Q. If the cord and tassel is taken off, is there anything to prevent the pawl from engaging in the ratchet?

A. No; because the weighted tail will then, in consequence of such removal, always tend to cause the pawl to engage with the ratchet.

38 X Q. The cord and tassel being removed and the pawl released from the ratchet by pulling down the curtain, the curtain being so far drawn down as to bring the pawl upon the top of the next tooth of the ratchet, will not the force of the torsion-spring in the curtain wind up the curtain before the pawl could engage with the tooth?

A. No; and there is no such mode of operation stated in the patent with reference either to the spring pawl shown in Fig. 5*a* or the weighted pawl shown in Fig. 1, and the teeth of the ratchet and acting face of the pawl are formed so as to prevent such a rolling up of the shade as is stated in the question. The fact that Smith shows a trigger and cord applied in Fig. 5*a* would be sufficient proof, if others were wanting, that the roller was not intended to operate as stated in the question, because in case it was constructed so to operate then the trigger and cord would be useless. The same would be true of the construction of the weighted pawl shown in Fig. 1—neither trigger, cord, nor tassel would be necessary for the purpose of operating the shade.

39 X Q. In your answer to the preceding question you say "No;" is that part of your answer founded upon theory or upon experiment?

A. It is founded upon examination of the patent and drawings, aided by a pretty long experience in the operation of ratchets and pawls of various shapes, and upon subsequent experiment with the model, or rather the actual shade-roller, made in accordance with the Smith patent, and marked "Complainant's Exhibit Smith's Roller 1."

123 Defendants' counsel puts in evidence a drawing, marked "Defendant's Exhibit Drawings of Pawls, October 30, 1882."

S. N. W., ex'r.

(Here follows diagram marked p. 122.)

40 X Q. Will you look at Defendants' Exhibit Drawings of Pawls, in which Fig. 1 represents a pawl having a right-angled pawl designated by the letters A B C, Fig. 2 has an obtuse-angled pawl desig-

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"Defendants Exhibit Drawings
of Pawls. S.N.W. Ex
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Fig. 1.

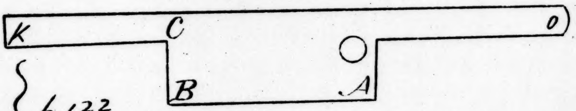

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Fig. 2.

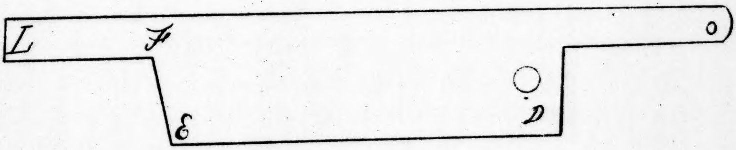
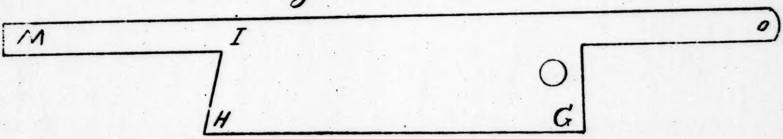


Fig. 3.



nated by the letters D E F, and Fig. 3 an acute-angled pawl designated by the letters G H I, and state what the comparative tendency of these pawls would be in arresting a ratchet having corresponding faces on the teeth; in the drawings the large circles represent the pivots of the pawls, and the small circles the holes through which the cords are to be passed in the end of the triggers, and the parts marked K L and N L represent the weighted end of the pawl?

A. They all would tend to arrest the ratchet, and with what comparative degree of certainty they would arrest the ratchet would depend to a considerable extent on the diameter of the ratchet-wheel, the size of its teeth, and the position of the ratchet-axle with respect to the pivot of the pawl. If the axis of the ratchet be supposed to lie vertically under the centre of the face of the pawl, and the tooth has a straight face of the same depth as the face of the pawl, or nearly so, the face of the tooth being so formed as to come in contact throughout its extent with the face of its pawl, and the pawl and trigger, as a whole, to lie nearly horizontal when the former is in its engaging position, and on the further condition that the pawls, triggers, and weighted ends were all of the same weight and length, the pawls being all alike except as to the inclination of their engaging faces, then with a coil-spring or torsion-spring tending to turn the ratchet-wheel round, pawl Fig. 3 would hold the hardest—that is, be less easily disengaged, and pawl Fig. 2 would be the easiest disengaged, while pawl Fig. 1 would occupy a place somewhere between them.

124 41 X Q. What is the action of these different pawls in arresting the ratchet—that is, would Fig. 1, Fig. 2, or Fig. 3 have a tendency to fly outwardly when struck by the tooth of the ratchet, and would any of them be drawn inward when so struck?

A. Figure 2 would have a very slight tendency—hardly perceptible—to fly outward or upwards when struck by the tooth; there would be no practical tendency of figure 1 to fly upwards, and there might be a slight tendency in figure 3 to be pulled downwards, although I am not sure at that point. This answer is based upon the same conditions of construction mentioned in the answer to the last question, and upon the position of the pawl-pivots shown in the exhibit drawings.

42 X Q. Will you look upon figure 1 in the Smith English patent and state if the face of the pawl makes an angle with the bottom of the pawl—which does it most resemble of the three figures in Defendants' Exhibit Drawings of Pawls?

A. As I understand it, the face of that pawl is made like Fig. 1 of the exhibit drawings. It certainly has not the obtuse angle represented in Fig. 2, nor the acute angle represented in Fig. 3. The tooth in the Smith English patent, which is represented as coming in contact with the pawl, is represented as slightly hooked over, so that it would apply its whole face to a pawl somewhat like Fig. 3 in defendants' drawings of pawls, but not so much sloped; but I should suppose that the drawing in the Smith English patent was meant to represent a pawl having a face like Defendants' Exhibit

No. 1, and a pawl not hooked over, but with a face such as would be suitable for engaging in the pawl like Fig. 1 of exhibit drawing. I gather this from looking at all the teeth in the ratchet-wheel in Fig. 1 of the Smith patent.

43 X Q. Will you make the like comparison between the figures on Defendants' Exhibit Drawings of Pawls and the Complainant's Exhibit Smith's Roller 1 ?

125 A. The pawl in Complainant's Exhibit Smith's Roller, 1, is like Fig. 1 in Defendants' Exhibit Drawing of Pawls, and like Fig. 1*a* of the drawings of the Smith patent. It may vary a half a hair's breadth from either of them, but there is no substantial difference between any two of the three.

44 X Q. Look at Complainant's Exhibit Smith Roller, 1, and state if the pawl will always catch in the ratchet if the cord and tassel is removed from the trigger of the pawl, and the curtain allowed to roll up freely ?

A. Yes ; it will.

45 X Q. Did Hartshorne's invention in his first patent depend upon the shape of the pawl and the rachet teeth ?

A. Substantially. It was by means of the shape of the pawl and the ratchet teeth and wheel and their arrangement with respect to each other that he produced a shade-roller which was automatic—that is, could be operated without the use of a trigger and by the use of one hand only applied to the shade, or a string, or a string and tassel attached to the shade.

46 X Q. If Smith's English patent could be operated without the use of the trigger by simply pulling down and releasing the curtain, as in Hartshorne, would there have been any invention in Hartshorne's first patent ?

A. I do not think I exactly understand the question. All curtains, whether the Hartshorne or the former ones, can be pulled down in the same way. When the curtain is let go by the hand after being pulled down it will in Hartshorne commence to rise and continue rising until its velocity is checked, when it will be stopped. This operation is what I suppose the question refers to. Smith's patent curtain cannot be so operated, and I cannot answer the question until you inform me of the changes you are going to make in the Smith curtain in order to make it operate like Hartshorne. If you are going to change Smith's so as to convert it into a curtain
126 as a whole, like the curtain in Defendants' Exhibit Smith
English Patent, you will then have represented the invention of Hartshorne's first patent, although in an inferior form. And when you thus have the Hartshorne invention the trigger and cord become unnecessary, mere surplusage.

47 X Q. Did you direct the model-maker how to construct the Complainant's Exhibit Smith's Roller, 1 ?

A. No ; not directly. I told Mr. Kettle to tell the model-maker to cut out a tracing from Smith's patent of the pawl, its weighted tail and trigger, and of the rachet-wheel, to lay them on a piece of sheet brass and file the brass in shape exactly like the tracing ; to mount them as they were shown in the drawings, and to make the rest of the contrivance in exact correspondence with Smith's drawing. I was so busily engaged that I could not spare time to see the model-maker myself. I think I used the phrase, "Tell the model-maker to make a Chinese copy."

48 X Q. Did you give Mr. Kettle any instructions in reference to the cord and tassel and as to how much or how heavy they should be weighted?

A. None that I remember; but Mr. Kettle probably heard myself or Mr. Law say that the patent called for a cord and tassel sufficiently heavy to hold the pawl up out of contact with the ratchet-wheel.

49 X Q. How was the roller in the Smith patent supported?

A. It was supported on two journals, one at each end. The journal on one end revolved with the roller; the journal at the other end was stationary, and the roller revolved upon it.

50 X Q. Was the ratchet-wheel on the part which revolved, or on the stationary part of the roller?

A. The ratchet-wheel was fastened upon the end of the roller, and revolved with it.

51 X Q. Where was the pawl attached which engaged with this ratchet-wheel?

127 A. The pawl was pivoted upon a box or disc, which was supported by the stationary spindle of the roller.

52 X Q. If the spring in this roller was wound up and fastened by the pawl engaging with the ratchet, would the spring unwind when the roller was removed from the supporting brackets after one of them was unscrewed from the window-jamb.

A. No; it would not, unless the trigger was accidentally or designedly disturbed.

Adjourned to Tuesday, October 31st, at 10.30 a. m.

NEW YORK, *October* 31, 1882.

Met pursuant to adjournment.
Present: Counsel as before.

Cross-examination of HENRY B. RENWICK continued:

53 X Q. Will you look at the patent of Jacob Davies, No. 69189, and state, if you please, what is claimed in the first claim of said patent?

A. The whole patent relates, as stated in one of the opening paragraphs, to a novel construction of shade-roller, and describes the operation of the centrifugal pawl in connection with what is really a ratchet-wheel, and I think I have before stated that the pawl or detent is described in the patent as sent outwards by centrifugal force when the roller is revolving rapidly and at a times when the detent is above the centre of the roller and the roller moving slowly or is at rest, then the detent will drop and engage with the ratchet, dropping by the force of gravity; and I understand the first claim to refer to the combination of a detent, so combined with a roller and the ratchet that the detent would

operate substantially in the manner described in the patent.
128 The ratchet is not mentioned in the claim in words, but I assume it to be there because the combination of the roller and detent would be entirely inoperative without the ratchet, and because the patent states the engagement of the detent with the ratchet as a part of the operation of the detent or pawl.

54 X Q. Will you look at the certified copy model David patent, the roller being at rest and the pawl resting against the bracket. Now, will you slowly unwind the curtain until the roller has made a half revolution, and tell me in what position you then find the pawl?

A. I suppose you mean the detent resting against that part of the bracket which is really the straight face of the ratchet tooth?

Defendants' counsel says yes.

[A.] If the roller be moved from that position a half turn by pulling down the curtain, the detent will then be directly under the shaft of the roller, and its action face is then near the periphery of the roller.

55 X Q. What do you mean by its acting face?

A. I should have said its acting end—I mean that end of it on which the acting face that engages with the pawl is found.

56 X Q. Was there any centrifugal force employed to throw the acting end of the pawl to the outer circumference of the roller in that operation?

A. No; the roller was moved too slowly.

57 X Q. Will you draw down the curtain in the David model until the pawl is at the under side of the roller? Now, will you allow it to roll up a quarter of a revolution, and state in what position you then find the pawl?

A. The pawl then is in the same horizontal plane as the centre of the shaft lying in its slot, which is then horizontal, and has not moved away from the periphery of the roller to any substantial extent.

129 58 X Q. Was there any centrifugal force used in keeping the pawl in the position which it retained during the quarter revolution.

A. No; I moved the roller too slowly.

59 X Q. Cannot the roller be revolved so rapidly from the lower position of the pawl as to carry it past the point reached in your last experiment, and also carry it over the ratchet so swiftly as to prevent the bringing down of the pawl by the action of gravity?

A. Yes; because then centrifugal force will come into play and hold the pawl out of contact with the ratchet while the pawl is moving up to and past the top of the ratchet-tooth, the centrifugal force overcoming gravity and holding the pawl out at the periphery of the roller, so that it cannot engage with the tooth.

60 X Q. In the last question and answer you say that centrifugal force came in play; when did it begin to come in play; that is to say, at what point of the revolution of the roller?

A. At that point where the revolution became sufficiently rapid either to hold the pawl at the periphery or throw it to the periphery and then hold it there.

61 X Q. Will you look at the Campbell reissue patent No. 7367 and state what is the invention claimed in the first claim of the said patent?

A. The combination of a pawl or detent or pin with a ratcheted hub or ratchet, and a shade-roller provided with a spring which will act to roll it up, not generally, but in so far, specifically, that the pawls shall work under the operations of centrifugal force in the manner as described in the patent, and that the ratchet or ratcheted hub, or its equivalent, shall be made upon or form part with the stationary spindle on which one end of the roller turns, so that when the pawls, which are mounted on the revolving part of the roller, are engaged with the stationary ratchet, then the shade, as a whole, can be removed from its brackets or bearings and, in
130 the words of the claim, preserve the tension of the spring, or, in other words, keep it locked so that it shall not unwind.

62 X Q. Can the roller in the Smith's English patent be removed from its brackets and the tension of the spring be preserved; and, if so, does not that anticipate this first claim of the Campbell reissue?

A. I have already answered that the spring is locked in Smith's English patent when the roller is removed from its bracket after unscrewing one of them. In my opinion the fact that this result is obtained by the English structure does not anticipate or render invalid the combination claimed in the first claim of the Campbell reissue.

63 X Q. Will you give your reasons for your last answer?

A. The combination of the first claim of the Campbell reissue would be of such a character that the spring must be locked when the roller is removed from the bracket. But this is not the whole limitation of the claim, which further requires that the pawls shall act by centrifugal force, and, therefore, that the pawls shall be arranged on a revolving part of the contrivance, and that the ratchet shall be secured upon a stationary shaft; and, also, that the whole contrivance shall be of such a character that the shade can roll itself up without obstruction when permitted to roll rapidly, and shall be caught when permitted to roll slowly, owing to gravity then overcoming centrifugal force. Now, in the Smith patent in both forms, namely, the spring pawl and the gravity pawl, the pawls are mounted upon a non-revolving part of the contrivance and could not by any possibility be operated by means of the trigger and cord, or either of them, if the pawls were mounted upon a revolving part of the contrivance, as they are in the Campbell shade-roller. Further, in the Smith contrivance the ratchet-wheel revolves and is mounted on a roller, while in Campbell the ratchet or ratcheted hub is stationary and mounted on a stationary part of the spindles, and
131 Campbell was the first, so far as I know, to mount a ratchet or ratcheted hub on the stationary part of the spindle. Campbell's roller, as a whole, combines in one roller the advantages which are retained by the contrivances both of Smith and David, and his contrivances, combined as described, are not a mere adding of the contrivances of Smith to the contrivances of David, but, in my opin-

ion, a new combination and arrangement of certain parts—the whole number of parts necessary to render the Campbell roller operative being no greater than are found in David and less than are found in Smith.

64. X Q. What elements are left out of the Smith' English patent to form the first claim of the Campbell patent?

A. You cannot, by leaving out parts of the Smith patent, convert it into the Campbell roller. You must not only mount the ratchet of Smith differently, but also mount the pawl differently, so that it can revolve and will be affected by centrifugal force. Both forms of the Smith patent contain a trigger and cord, and one of them contains, also, a tassel attached to the cord; neither trigger, cord, nor tassel are used by Campbell, and his contrivance is such as forbids their use. Further, in one form of the Smith there is a weighted tail to pull the pawl into contact with the ratchet wheel, and in the other a spring to perform the same duty; neither the weighted tail nor spring are found in Campbell, nor are they necessary to the operation of his contrivance.

65 X Q. Will you look at the first claim in the Campbell reissue, and at the claim in the orignal, and state whether the first claim in the reissue is or is not broader than the claim in the original—that is to say, whether the first claim in the reissue will cover devices which the claim in the original would not cover?

A. That will depend entirely upon the construction which the court shall put upon the words of the original claim. If the words "loose or sliding pins or bolts F" are held by the court to
132 limit the pawl of the claim to a sliding pawl, and shall say that
those wads do not include pawls of different form, but having precisely the same mode of operation to engage at times with the ratchet under the force of gravity, and to be kept out of engagement at times by centrifugal force, then the claim of the original patent will be narrower than the first claim of the reissue. But if, on the contrary, the court shall hold that the words above quoted include known forms of pawls so mounted upon the roller as to operate and perform precisely the same duties that the pins or bolts F do, then the first claim of the reissue is no wider or broader than the claim of the original. Further, I find in the original claim the words "the flattened or notched shaft D." Now, if the court shall hold that those words exclude all ratchets, except one formed on the body of the shaft itself, then the first claim of the reissue is broader than the claim of the original, because the former clearly includes other stationary ratchets mounted upon the shaft other than the precise form shown in the reissue drawings, but operating in precisely the same manner as if they were formed out of the body or shaft. The question appears to call for my own opinion, which is as follows:

The claim of the original patent is not to the pins or bolts (which are the pawls) alone, nor to the notched shaft or ratchet alone or by itself, nor is it to those parts precisely in the form shown, but the claim is to a combination, a combination of those parts not exactly but "substantially as herein shown and described, and for the purposes set forth."

The claim, therefore, as a whole, seems to me to me to include not only the combination of the parts in the precise form in which they are represented in the drawings, but the combination of other forms of those parts or known substitutes for them, provided the parts are so combined substantially as shown and described in the patent that they will work under the mode of operation set forth in 133 the patent, and produce the results or purposes which are attained in the combination described in the patent. In my opinion, therefore, the first claim of the reissue is no wider than the claim of the original patent.

66 X Q. I find in the first claim of the reissued patent to Campbell the following as part of the claim: "So that when the roller is removed from its brackets the tension of the spring will be preserved;" do you find that shown and described or claimed or set forth as a purpose in the original?

A. The original patent does not say that the spring will be locked when the roller is removed from its brackets, but it says, in substance, that one end of the spindle D is stationary, that the ratchet makes parts of this stationary spindle, which latter is secured in the jaws of the bracket E, and that the pawls are mounted upon the roller. Now, if the contrivance be constructed in accordance with the directions of the original, the resulting structure will be one in which the spring will be locked when the roller is removed from the jaw of the bracket. The drawings of the patent represent or show a structure which will produce this effect. As the claim is in substance to a structure made and operating substantially as described in the patent, the claim covers a structure in which the spring will be locked when the roller as a whole is removed from the brackets.

67 X Q. Is there anything said in the original specification about removing the shade from the bracket?

A. No; but the specification says in substance that the bracket E is formed with a jaw, which means on open slot, which would permit the removal of the roller as a whole without unscrewing the brackets from the window jamb.

68 X Q. I find in the original patent the following: And the projecting end of which is secured in the jaws of the bracket E." Does the word "secured" in that sentence mean simply laid in, or 134 does it mean permanently fastened? Please refer to the certified model of the Campbell patent.

A. I suppose, from the patent above, that the word means laid in the slot so that the roller can be operated in the manner described in the patent. The roller can be so operated when the square end of the spindle is merely dropped in between the jaws. On reference to the model I find something not represented in the drawings of the patent or described therein, namely, a pin passing through the open-topped jaws and the square end of the shaft, preventing the roller as a whole from being knocked or taken out of place until the pin is pulled out by the finger.

69 X Q. If the word "secured," referred to in the former question, meant simply "laid in," as you have implied it did, why was it nec-

essary in the reissue to put it in the following form: "But is held or secured in the jaws of the bracket E"?

A. I don't know any reason making the verbal change necessary?

Redirect:

70 Re-D. Q. Is it not a necessity, from the construction of the Campbell roller, as described in the original patent, that the spring must be locked by the engagement of the pawls or detents with the ratchet or notched spindle when the roller is at rest, and when it is removed from the brackets?

A. Yes.

71 Re-D. Q. Does not the certified copy of model of Campbell patent show that the roller can be removed from the brackets at pleasure and without removing or in any way changing the position of the brackets?

A. Yes.

HENRY B. RENWICK.

Subscribed and sworn to before me—

S. NELSON WHITE,
Examiner, &c.

135 JACOB DAVID, a witness called on the part of complainant, having been duly sworn, deposes, in answer to interrogatories put to him by S. D. LAW, counsel for complainant, as follows:

(Testimony of Jacob David taken Oct. 26, 1882, the examination of Mr. Renwick being suspended for that purpose.)

Int. 1. What is your name, age, residence, and occupation?

A. My name is Jacob David; I am 61 years of age; I reside at 114 St. Felix street, Brooklyn, N. Y.; and I am an internal revenue gauger.

Int. 2. How long have you been acting as gauger?

A. Since '71, about 11 years.

Int. 3. Look at the patent marked "Complainant's Exhibit David Patent," and which is No. 69189, dated September 24th, 1867, and state whether you are the same person to whom said letters patent were granted.

A. I am.

Int. 4. State when, or how long before said letters patent were granted, you made the invention described in said patent.

A. In December, 1866.

Int. 5. At that time, in December, 1866, did you have a model made of your invention, or was the date you have given the date of your conception of the invention?

A. Well, immediately—I cannot locate the time exactly when I made the conception of the invention, but I recollect distinctly the time and place the conception came to me. The trouble with Mr. Hartshorn's roller, which we were using at that time, by the noise that the pawl made, in manipulating the shade up and down, it was an annoyance to me and to our customers, and incited me to invent something that would do away with the noise. While returning from work to the store one day, walking by the old hospital wall, in Church street, this conception, as embodied in this patent, came to me.

136 Int. 6. With or for whom were you work at that time?

A. With the firm of Barton, Terhune & Brett, shade manufacturers, in the city of New York, at No. 20 Ann street.

Int. 7. After you so formed the conception of that invention what, if anything, did you do about making a model or working roller embodying your invention?

A. I commenced immediately.

Int. 8. Are you able to state positively whether you made that conception prior to New Year's 1867, or after what time?

A. Well, I can't bring any instance to bear or any circumstance that would fortify anything I might say in that respect.

Int. 9. How long was it after you made the conception that you completed a working model or roller embodying your invention?

A. It was about three weeks.

Int. 10. Who made the first model of your invention?

A. I did.

Int. 11. And did the firm with whom you was at work then commence to make rollers according to your invention?

A. No, sir.

Int. 12. Did you take any steps immediately to obtain a patent for your invention, or what did you do about that?

A. No, sir; I did not take steps to get any patent at that time.

Int. 13. Why not?

A. Because I thought the models that I had made—I made three or four models— were not perfect enough to send to the Patent Office. My first model—I tried to make it a tin roller, but found it difficult to locate the pawl, on account of the block at the end of the roller not being long enough; and finally completed the roller that
is now in the Patent Office as a model, which I had hanging
137 behind my work-bench in the store at least six months previous to making application for a patent.

Int. 14. You spoke about the Hartshorn roller "which we were using at that time;" that is, the time when you conceived your invention. Look at the patent now shown you, marked Complainant's Exhibit Reissue No. 2756, and state whether the roller referred to in that patent is the one you refer to as the one you were using.

A. The pawl in said patent looks like the one I had reference to. The pawl was fastened to the bracket, and there was a notched hub at the end of the roller; that is the one I refer to.

Int. 15. Have you at any time before this been examined as a witness in any suit as to your invention, described in the patent Complainant's Exhibit David Patent; and, if so, in what suit, if you can state?

A. Yes; in the suit of the Salem Shade Roller Manufacturing Company against Harris.

Int. 16. About how long ago was that, if you remember?

A. About six or seven or eight years ago; I cannot recollect the time exactly.

Int. 17. Have you been examined to that point before this in more than one suit?

A. No, sir.

Cross-examined by Mr. HUNT:

X Int. 18. Are the claims in the patent issued to you the same as those set up by you in your application for a patent?

Objected to by complainant's counsel, on the ground that the records of the Patent Office are the best evidence of the fact inquired of.

138 A. I did not write the claims in the application, but I suggested them, and I think the claims in the patent as granted are not the same as those first made.

X Int. 19. Who made the alterations and corrections in the claims in your application for this patent?

A. Van Santvoord and Hauff.

JACOB DAVID.

Sworn to before me—

S. NELSON WHITE,
Examiner.

139 NEW YORK, *November* 1, 1882.

Met pursuant to adjournment.

Present: Counsel as before.

Complainant's counsel having yesterday learned of certain changes and alterations in the testimony of defendants' expert witness, William E. Hagan, made by the said witness in his testimony after his examination and after his testimony had been closed, and which alterations appear in the testimony of said witness, as signed by him, objects to the following alterations and amendments in the testimony of said witness:

Alteration in answer 16, page 21, of defendants' printed record as altered.

Alteration in answer 19, page 25, line 3 of answer.

Alteration in answer 20, at page 27, in line 27.

Alteration in same answer at page 28, in line 21.

Alteration in answer 24, at page 31, in line 6.

Alteration in answer 27, at page 34, in line 4.

Alteration in answer to cross-question 21, at page 42, in line 4 of the answer.

Addition to answer to cross-question 24, on page 43.

Alteration in answer to cross-question 25, page 43, in lines 1 and 4 of the answer.

Addition to answer to cross-question 27, on page 43 of the record.

Alteration in and addition to answer to cross-question 31, at pages 44 and 45 of the record.

Alteration in the answer to cross-question 76, at page 57 of the record.

As changing the sense of the said several answers as originally given by the witness on his examination; and complainant's counsel gives notice that he shall on the hearing move the court that these alterations and changes be stricken out, and that the answers of the said witness stand as originally given.

140 And complainant's counsel here formally requests and insists that the testimony of said witness, as written out by the stenographer from notes taken on the examination of said witness, be filed with the court.

SAMUEL P. KITTLE, a witness for the complainant in rebuttal, being duly sworn, in answer to interrogatories propounded by S. D. LAW, Esq., of counsel for complainant, deposes and says:

Q. 1. Were you examined as a witness in this case on the opening testimony of complainant?

A. I was.

Q. 2. Are you familiar with and do you understand the letters patent 44624 granted to the complainant, and which are the original of letters patent reissue 2756?

A. Yes, sir.

Q. 3. Are you familiar with and do you understand the invention described in letters patent 69176 granted to William Campbell, and which are the original of the letters patent Campbell reissue 7367?

A. I am familiar with the patents referred to in the question and understand the same.

Q. 4. Are you familiar with and do you understand the letters patent No. 68502 granted to the complainant, and which are the original of the letters patent Hartshorne reissue 7370?

A. I am familiar with the patent referred to in the question and understand it.

Q. 5. Have you read and do you understand the English letters patent granted to David Davies, being No. 2416 of 1854, and which are marked "Defendants' Exhibit Davies' English Patent"?

A. I have read the patent referred to in the question and understand the same.

Q. 6. Have you read the English letters patent granted to Edward Smith, being No. 12375 of 1848, and which are marked "Def'ts' 141 Exh. Smith English Patent," and do you understand the structure described therein and the operation thereof?

A. I have read the patent referred to in the question and understand the structure described therein and its operation.

Q. 7. Have you read the testimony taken on the part of the defendants in this cause, and particularly the testimony of defendants' expert, William E. Hagan?

A. I have read the testimony referred to, and also heard it while it was being given.

Q. 8. What is the nature of the improvements, so far as relates to shade-rollers described in the Smith English patent 12375 of 1848?

A. The improvements consist in the adaptation of means for rotating a shade-roller and winding up a window-shade and holding

it at different or desired points. One kind of means for that purpose is illustrated in Fig. 2 of the drawings and described in the Smith patent. Another kind of means for that purpose is illustrated in Figs. 3, 4, 5, and 5A, and still another kind in Fig. 1 of the drawings. Figs. 3, 4, and 5A, taken with the words of the specification of the Smith patent, describe the employment of a twisted or torsion spring for rolling up the curtain and preventing it from unrolling at different points, and a pawl and ratchet for preventing the spring from winding the curtain up further than is desired. This pawl and ratchet is a very old and well-known mechanism used in connection with spring shade-rollers where the helical or coiled spring and the ribbon or wound volute or watch-spring was used for the same purpose that Smith uses the torsion spring for, and in which cases, like Smith, the pawl and ratchet were used and engaged, and were disengaged in the same manner and for the same purpose, to wit, the pawl was provided with a trigger at its outer end and a spring at the inner end, the spring operating to cause the engagement of the pawl and the trig-
142 ger being being operated directly or by means of a cord and tassel connected therewith by one hand to disengage the pawl from the ratchet teeth, while the other hand was employed to prevent the curtain from being unduly rolled up under the force of the spring operating the roller. In the above mechanism as described it will be observed that to disengage the pawl from the ratchet it was necessary to pull down the outward-projecting trigger end thereof against the force of the pawl spring, while the engagement of the pawl with the ratchet was insured (irrespective of and without resort to the trigger and pendent cord) by the force of the pawl-spring. Smith describes in his patent a different means or mechanism (from that last explained by me), which he illustrates in Fig. 1 of his drawings, which mechanism is for the same purpose as that above described, but which utilizes a different force for insuring the engagement of the pawl and ratchet and which employs the cord and tassel for a different and opposite purpose from that before described by me, the ratchet in both constructions being substantially the same, while the pawl is substantially different, being made with a weighted inner end which causes the engagement under given conditions. See Fig. 1 of the drawings and the 3d paragraph, commencing about the middle of the 3d page of the written specifications of Defendants' "Exhibit Smith English patent" and the 1st claim of the said patent. This improvement of Smith embraces not only an inner weighted end of the pawl for the purposes before stated, but also the employment of a cord and tassel on the outer or trigger end heavy enough to more than counterbalance the inner weighted end of the pawl, so that the pawl is held out of engagement with the ratchet and the weighted end held by the greater weight of the cord and tassel attached to the outer or trigger end of the pawl; therefore, to cause the engagement of the pawl with the ratchet to prevent the rolling up of the curtain (by the force
143 of the spring used for that purpose), it is necessary to lift the cord and tassel with one hand and allow the weighted end to

bring the pawl into engagement while the curtain is manipulated with the other.

This new improvement of Smith in the operation of the pawl and ratchet gets rid of a rattling and disagreeable noise which existed in the old construction of pawl and ratchet as operated under the influence of the pawl spring, as shown in Fig. 5 A of the Smith patent, in which construction the pawl, in drawing down the shade, was continually dropping down from the top of the ratchet-tooth to the bottom by the force of the pawl-spring as the ratchet revolved under the pawl; while in the new construction, in drawing down the shade, the pawl would immediately be raised up off the ratchet, and above the same, by the weight of the cord and tassel attached to its trigger or outer end, and so the roller was revolved noiselessly, while to engage this new pawl with the ratchet it was necessary to lift the weight of the tassel and cord so that the inner weighted end would cause the engagement of the above parts.

Q. 9. Referring to the "Exhibit Smith English Patent," and the quotations made therefrom by the defendants' witness, Hagan, and found on pp. 22, 23, and 24, of the defendants' record, look at what that witness says on pp. 24 and 26 of the record as to the Smith roller having an operation that will permit the pawl, when the curtain is moved rapidly, to run over the ratchet so as not to engage with it, but when moved slowly the pawl would drop into the ratchet hub, and state whether, in your opinion, the roller described in said Smith patent does or can have any such operation or mode of operation as defendants' witness states, and give your reason for any opinion you may express.

A. I think Dr. Hagan is mistaken in his view as expressed in the answers referred to, as is demonstrated by the shade fixture "Complainant's Exhibit Smith Roller, No. 1," which is made in 141 strict accordance with the description and drawings of the Defendants' "Exhibit Smith English Patent," the making of which model I supervised myself; and for the further reason that the quotation from the Smith patent by Dr. Hagan in his answer, and his conclusion therefrom, ignores an important descriptive part of that operation found in the paragraph before referred to by me on the 3d page of the written specification of the Smith English patent, which I quote: "The first consists in dispensing with the spring ordinarily used to press the pawl on the ratchet-wheel, which controls the action of the roller. I effect this by weighting the short or inner end of the pawl, as shown in Fig. 1 of the annexed drawing, so that when it is desired to cause the pawl to catch into the teeth of the ratchet *it is only necessary to relieve it of part of the weight of the cord and tassel by holding it up by the hand.*" The emphasis in the quotation is my own, to call attention to the part of the description which I think Dr. Hagan overlooked, and which clearly describes a necessary operation of the construction wholly different from what Dr. Hagan finds. I also call attention to the 1st claim of the Smith English patent. I find also that were the facts as stated by Dr. Hagan, then the statement of the inventor in the sentence in the patent following the one quoted by me would not be true, to wit: "The operation is thus perfectly noiseless."

Q. 10. According to the Smith English patent, what must be the weight of the cord and tassel attached to the outer end of the pawl, as shown in Fig. 1, as compared with the weight of the short or inner end of the pawl?

A. It must be considerably greater—certainly enough greater to raise the inner end and hold it out of engagement when the weight of the cord and tassel is allowed to exert itself.

Q. 11. Referring to the pawl-and-ratchet wheel of the Smith patent, as shown in Fig. 1, state whether the form and arrange-
145 ment of such parts is such as to permit a full and complete engagement of the pawl with the ratchet-teeth, or only a slight and partial engagement?

A. The form of the parts referred to is such as to permit of a full engagement, and such would be their operation.

Q. 12. Would it be possible for the ratchet-wheel shown in that figure to revolve at all so as to carry up the curtain, unless the pawl was in some way kept entirely out of engagement with the ratchet-wheel?

A. I think not.

Q. 13. Examine the shade fixture marked "Defendants' Exhibit Model Smith English Patent," and compare the same with the fixture described in the Smith English patent, and give your opinion whether said exhibit is constructed in accordance with said patent, and wherein it differs from the structure described in said patent, and point out the differences, if any, between such exhibit and patent, and what is the effect of such differences in the operation of said exhibit shade-fixture, referring, if you desire, in your answer to the drawing marked "Complainants' Exhibit Drawing of Pawls and Ratchets."

A. I have examined the shade-fixture referred to in the question and compared it with the fixture described in the patent, Defendant's Exhibit Smith English Patent, and figure 1 of the drawings of the patent. I think the Defendants' "Exhibit Model Smith English Patent" is not a correct representation of the construction described in the patent referred to by me. It is substantially different, in my opinion, in its parts and elements, and combination of parts, in construction and operation. In the first place the shade has a weighted bar and tassel attached to its free or low end, the effect of which is to modify to some extent the quick action of the spring in rolling up the curtain, and which is not found or described in the patent. The roller, I understand, is provided with a helical or coiled spring, instead of a torsion-spring; the brackets in which the roller
146 is mounted are different, in that the one at the pawl-and-ratchet end, or fixed spindle end of the roller, is an open bracket instead of a clossed bracket like that in the patent, which open bracket admits of the roller being put up or taken down without loosening the screws or removing the bracket from the window frame, whereas the reverse is a necessity of the construction described in the Smith patent, which difference I regard as a substantial differ-

ence, although I do not regard the employment of a different kind of spring in defendant's model as of materiality. The most important and material distinctions or differences between Defendants' "Exhibit Model Smith" English Patent and the construction divulged in the Defendant's "Exhibit Smith English Patent" appear in the stop-works. First, in regard to the ratchet-wheel, which is provided with segmental concentric riding surfaces for the pawl, with short abrupt inclined notches, with shallow acting faces to engage the acting face or toe of the pawl, and in the crooked or backward incline of the extreme engaging toe of the pawl, and in the peculiar elongation and curve of the weighted inner end or tail of the pawl, which is also made and bent so as to prevent the deep full engagement of the pawl toe with the tooth of the ratchet.

Such bent, weighted end is made to ride the concentric segments of the ratchet when the pawl toe is slightly engaged with the tooth of the ratchet, so that the pawl toe, a little above its engaging point in some cases, actually overlaps the tooth of the ratchet, with which it very slightly engages, as may be seen by turning the file mark on the end plate of the roller, opposite the toe of the pawl, which mark is put on the plate by me to call attention to the above fact.

The effect of the above construction of the pawl and ratchet tends to cause and secure an automatic operation of these parts without the employment of the pawl-trigger, or a cord or tassel attached thereto or with them, and by the manipulation of the shade 147 alone, which is an operation wholly different from that described in the Smith English patent, and which automatic operation could not be had were the pawl and ratchet in the model made and combined as illustrated in the patent.

Furthermore, the trigger of the pawl in the model is provided with a light cord, but no tassel, whereas the tassel that should be found in connection with the trigger cord has in the model been transferred to the pendent end of the shade, which it will be found when transferred back to where it belongs, according to the description of the patent, to wit, on and with the cord attached to the trigger of the pawl, then the operation (notwithstanding the other changes of which I have spoken) will be that described in the Smith patent, though not so perfect in operation, owing to the above changes. I will simply say in regard to the drawing referred to in the question, "Complainant's Exhibit Drawings of Pawls and Ratchets," I think they are correct representations; Fig. A of the pawl and ratchet described in the Smith patent and illustrated in Fig. 1 thereof, and Fig. B of said exhibit of the construction of the pawl and ratchet of the fixture "Defendants' Exhibit Model of Smith English Patent."

Q. 14. Look at the shade-fixture marked "Complainant's Exhibit Smith Roller 1" and compare the same, particularly as to its pawl-and-ratchet wheel, with the Smith patent and the pawl-and-ratchet wheel shown in Fig. 1 thereof, and taking into consideration also the spring in said fixture and the parts attached to the outer end of the pawl state whether that structure is in construction and operation like or unlike the structure described and shown in the Smith

English patent, and give your reasons for any opinion you may express.

A. I have before stated, I think, that the exhibit referred to is made in strict accordance with the Smith English patent, and its operation is the same as the operation described in that patent; if I have not, I now say so. 148 When the spring is partly wound up and the curtain is drawn down, the tassel and cord being left free to act on the pawl, the weighted end of the pawl will be thrown up and the toe of the pawl carried out of engagement by the weight of the cord and tassel, and the curtain may be run up or down comparatively noiselessly. When the shade is stopped at the desired point and the weight of the tassel and cord partly raised the weighted end of the pawl will drop and engage fully and freely with the ratchet on the roller and hold the shade in such position against the force of the roller-spring, as described in that part of the Smith patent before quoted by me. The spring employed in the model, "Complainant's Exhibit Smith Roller 1," is the torsion-spring described in the Smith patent, and may be seen through a hole in the tin roller when the curtain is unwound.

Q. 15. State how the pawl and ratchet in the fixture "Complainant's Exhibit Smith Roller 1" compare in construction with the pawl and ratchet shown in Fig. 1 of the Smith patent and with Fig. A in the Exhibit "Complainant's Exhibit Drawing of Pawls and Ratchets."

A. The pawl and ratchet in the Smith roller, looked at from the squared end of the spindle, are identical with Fig. 1 of the drawing of the Smith patent and Fig. A of the drawing of pawls and ratchets. There is no substantial disagreement between any two of them. There is a portion of the plate which would be outside of the pawl shown in the model, and there necessarily for supporting the pawl, which is not shown in the drawing, this plate being mounted on and secured to the spindle with the squared end.

Q. 16. You have heretofore testified in this case to what you considered to be the invention described and claimed in the David patent; state whether, in view of the state of the art as shown in the English patents of Smith and Davies and the Hartshorn 149 patent, No. 44624, your views as to the David invention are modified and changed in any particular; and, if so, in what respect.

A. My views are not changed in any particular in consequence o what is shown in the patents referred to.

Q. 17. You have also heretofore testified as to what you considered to be the invention described and claimed in the Campbell reissue 7367. State whether, in view of what is shown in the English patents of Smith and Davies, the Hartshorn patent 44,624, and the David patent, your views as to the invention described in the Campbell reissue are modified or changed in any respect; and if so, how; and whether you consider that the Smith shade-fixture, assuming that the spring therein is locked, and that the fixture can be removed from its bearings or brackets, in any manner or to any degree anticipates the invention described and claimed in the Campbell reissue.

A. My views are not modified or changed from the expression given to them in any previous testimony by either of the patents referred to in the question. I do not consider the invention described and claimed in the 1st claim of the Campbell reissue is in any way anticipated by the construction described in the Smith English patent. I am aware that the roller is locked against the force of the spring by the pawl and ratchet in the Smith English patent, so that the fixture may be taken from the brackets, and, if handled with care, the relation of the roller, spring, and spindle may be retained by the engagement of the pawl and ratchet of that fixture. But I do not regard that construction, to wit, the pawl with the outward extending trigger, one that would be likely to be acceptable or practicable as a locking device to the extent that the Campbell pawl or detent would be, for the reason that the projecting trigger would be so liable to be tripped, and the pawl be disengaged from the ratchet in handling, packing, and transporting a fixture
150 so made that it would be practically worthless for the pur-
poses of locking if that were its object. But were it practicable when constructed, as shown and described, for the purposes of locking the roller against the force of the spring when out of the brackets, still it embodies a very different construction and operation from the Campbell shade-fixture, for the reason that the Campbell pawl and ratchet, or notch and detent, is an automatic contrivance, operated by the manipulation of the shade alone, and with one hand applied thereto; whereas the contrivance described in the Smith English patent is not an automatic shade-fixture, but those parts are of such a construction as that they require the employment of two hands to operate them correctly and successfully, and the employment of some auxiliary device or devices to operate the pawl and ratchet successfully, such as weight or spring for the pawl at one end, and cord and tassel and trigger for the pawl at the other, as described and illustrated in the Smith English patent.

Adjourned to Thursday, November 2d, 1882, at 10.30 a. m.

New York, *November 2nd*, 1882.

Met pursuant to adjournment.
Present: Counsel for respective parties.

Direct examination of S. P. Kittle resumed:

18 Q. Admitting that the Smith English fixture will lock the spring when the roller is taken out of its brackets, and assuming that such roller was intended to be removed from its brackets at pleasure, and could be so removed at pleasure without disturbing or removing its brackets, would it, in your opinion, be only the work of a mechanic, or would it require invention to combine with the spring shade-roller having brackets adapted to allow the removal of it therefrom at pleasure an automatic pawl and ratchet
151 constructed and operating substantially as required in the
Campbell reissue 7367, and give your reasons for any opinion you may express; and referring to the character of the changes that would be required in such case from the combination of pawl and ratchet shown in the Smith patent?

A. I understand the question that I am requested to give you my opinion whether or not the pawl and ratchet of Smith is substantially the pawl and ratchet of Campbell in construction and combination, operation and result of operation; and whether the Campbell construction is an obvious construction when the Smith construction is before an ordinary mechanic—that is, such a construction as would be suggested to an ordinary mechanic. I am of the decided opinion that it is not, and that it would require invention to produce the Campbell construction with the Smith construction, notwithstanding all the knowledge and information imparted by the Smith construction. The pawl and ratchet employed by Smith are such a character and combination as to require means like that described in the Smith patent and before fully delineated by me, to wit, trigger and cord, or cord and tassel and trigger, at one end, and a spring or weight at the other; none of which is required of the Campbell pawl for the purpose of its operation, as shown and described; or at all, unless it be the simple matter of the necessary weight of the Campbell pawl. Furthermore, the Smith pawl is a pivoted pawl, and is on the stationary spindle of the roller and operates with a rotating ratchet which is fixed to the roller and moves with it; whereas in Campbell's construction the pawl is simply a little pin or bolt held loosely in a chamber in the end of the shade-roller, not a pivoted pawl, and carried in such loose and free condition round, by and with the roller. And the Campbell pawl and ratchet are especially adapted to each other for the purpose of
engaging or not automatically according to the action or mo-
152 tion given to the pawl by the speed of the revolution of the
roller. All of the differences referred to in the two constructions are important and substantial, particularly those which contribute to the action of the pawl and its adaptation to the ratchet or notch to secure engagement therewith for the purpose of such engagement. That is to say, the Campbell pawl and ratchet are of such a character as to be especially adapted to each other for an automatic action by the manipulation of the shade to regulate the speed of the revolution of the roller and so cause their engagement or not at will by one hand of the operator applied to the free end of the shade; while the construction and combination of the Smith pawl and ratchet are especially made and adapted for a manipulation by the employment of means additional and especial for operating the pawl with one hand while the shade is operated with the other. The two constructions are not alike in purpose or parts, in operation or combination. They are different constructions in purpose and principle, in my opinion, for the reasons above. And further, the Campbell pawl engages with the ratchet in all cases by gravity, and is held from engagement partially at least by centrifugal force, which is not the case at all with the Smith pawl, centrifugal force in case operating upon that pawl.

19 Q. In your last answer you speak of the Campbell construction of pawl as a pawl which is a little pin or bolt held loosely in a chamber in the end of the roller, not a pivoted pawl; do you consider that the first claim of the Campbell patent is confined to such a specific structure of pawl?

A. I do not; but I do consider that it is confined to a pawl or detent that would be an equivalent to such a construction for the purposes of that pin or bolt, and operating by substantially the same force and in substantially the same manner, and located on and at the end of the roller.

153 20 Q. You have also heretofore testified as to what you considered to be the invention described in the Hartshorne reissue 7370; state whether in view of the state of the art as has been shown in the various patents put in evidence your opinion and views as to the invention described and claimed in the Hartshorne reissue 7370 are changed or modified; and, if so, how?

A. My views are not changed or modified by the development of the state of the art as indicated by the question.

21 Q. Please examine the Campbell reissue 7367 and the original thereof, 69176, and state whether you find in the reissue any different invention described and claimed from that which is shown and described in the original; referring, if you desire so to do, to the certified model in the application of the original Campbell patent.

A. I have examined the patents referred to in the question frequently and now again; the parts shown in the reissue are shown in the original patent, and the parts described in the reissue are described in the original patent; the wording of the description in the reissue is more full than that of the original patent; and although there are three claims in the reissue and but one in the original, I do not see that there is any mechanism or part or combination of parts or operation described or claimed in the reissue which does not exist or which is not shown or described in the original; neither do I find any different mechanism or combination of parts or operation or result of operation shown, described, and claimed in the reissue which does not clearly exist as shown or described or which did not inhere of necessity in the construction shown and described in the original patent. I am aware, in making the above answer, of the difference in the illustrations of the invention which exists in the drawings of the reissue as compared with that of the original, which I do not regard as material, since what is illustrated and described and claimed in the reissue is also shown and is found

154 in the illustrations of the drawings of the original patent.

22 Q. Please examine the patent, Hartshorne reissue 7370, and the original thereof, 68502, and state whether you find in the reissue any different invention described and claimed from that which is shown and described in the original; and, in this connection, please examine the statement of defendants' expert, found in his answer to the 25th direct interrogatory, page 32 of the printed record.

A. I have examined the patents referred to in the question and also the statement of Dr. Hagan, defendants' expert. The invention described and claimed in the reissue is clearly shown and described in the original patent, although the claim of the original patent is different from the claim of the reissue. In the reissue I find a disclaimer for a feature or operation existing in the construction as described in the original patent and as described in the reissue which explains and modifies the claim in the reissue as described in my previous testimony in this case. In regard to the figures of the reissue referred to by Dr. Hagan, it is true there is the Fig. 3 added in the reissue that does not exist in the original, and Fig. 1 is said said to be a longitudinal central section of the roller taken at *x x*, Fig. 2, which *x x* in dotted lines should evidently have been placed on Fig. 2 instead of Fig. 3. I do not see as this error makes any difference or amounts to anything, because there is no difference between Fig. 2 and Fig. 3 of the reissue and Fig. 2 of the original, as regards the illustration given or sought to be given in Fig. 1 of the reissue, unless it be that of the brackets which are not shown in Fig. 3.

23 Q. The defendants' expert, in his 30th direct answer, says that he very much doubts whether the arm or detent *k* of the David patent is acted upon by contrifugal force in the operation of the
roller, or, in other words, whether the velocity with which the
155 curtain can be moved is sufficient to throw out this detent or
latch, as he calls it, by centrifugal force. Give your opinion as to whether centrifugal force does act in the structure described in the David patent to throw out the arm or detent in the operation of the roller, and give any reason you may desire for your opinion?

A. I think that Dr. Hagan is wrong in his view as stated. The claim 1 of the David patent, to which he refers, I think is clear enough in regard to the force of gravity and centrifugal force, for the operation of both of these forces tends to carry the arm or detent away from the centre of the roller as it revolves, and carries such detent below the axis; and were the roller revolved slowly by the force of the spring, with the detent passing upward from a vertical line from below the axis, the force of gravity would be allowed to act alone comparatively, and bring the detent down into engagement with the ratchet or notch; but were the roller revolved rapidly through the same section of the circle then centrifugal force would act with power enough on the detent to more than overbalance the force of gravity, and it would be kept up and out of engagement by centrifugal force against the force of gravity in that case. Now, I think it clear that at whatever speed the roller is revolved centrifugal force begins and increases as the speed of the revolution is increased and diminishes as the speed of the revolution is diminished, while the force of gravity is not at all dependent on the speed of revolution.

24 Q. Are the pawls or detents of the David roller, of the Campbell roller, of the Hartshorn roller, 7370, and of the defendants' roller actuated or kept out of engagement by the same law or force or by different forces in the several cases?

A. By the same.

Cross-examination:

25 X Q. You said in your last answer that the pawl in the Hartshorn reissue 7370, in the David patent, and in the Campbell
156 patent are all kept out of contact with the ratchet by the same
law or force. What is the law or force that keeps them out of contact?

A. Centrifugal force is exerted to prevent the engagement of the pawl with the ratchet in all.

27 X Q. Does the same force disengage them from the ratchet?

A. No; it is the form of the pawl and the ratchet, the toe of the pawl moving in the opposite direction in disengaging by the rotation of the roller in the opposite direction.

27 X Q. Will you look at the Hartshorne reissue 7370, and also at the original of that patent, and tell me if the disclaimer in the reissue patent does not disclaim what is claimed in the original as being the invention of Hartshorne?

A. I think not. The disclaimer, as I understand it, goes to that part of the operation only which is referred to by the words in the claim of the original, which I quote: "Whether the roller be fitted in the brackets or bearings or removed therefrom." And the disclaimer says: "I do not claim, generally, the arrangement of the pawl and ratchet," * * * "so that the roller can be removed from the brackets without permitting the spring to unwind," &c. So that I understand Hartshorne to claim the construction described in the original, but to limit it to the operation which is claimed in the original patent, exclusive of that which he regarded as not new with him—to wit, the construction that is effective to locking the roller when out of the brackets—although his construction does perform that function. In that respect the claim is different and narrower in the reissue than the claim of the original.

28 X Q. Do or do not the pawls or detents in the Campbell patent act substantially at right angles to the ratchet or notched hub?

A. Their acting faces, in engaging, are in a line parallel with the
acting face of the flattened spindle or ratchet as they move into en-
gagement. They hold by the force of resistence at right
157 angles to the face of the notched or flattened spindle or
ratchet. The body of the pawl moves out of engagement on
a curve pivoting on the point of the engaging toe until it drops by
gravity toward the periphery of the roller.

29 X Q. Would not that description apply equally well to the Hartshorne reissue 7370?

A. No; the tooth in the ratchet of the Hartshorne fixture, constituting the acting face of the ratchet, is at right angles with the toe or engaging part of the Hartshorne pawl, and, therefore, holds or locks at right angles. The pawl or engaging toe thereof moves out of engagement at right angles with the engaging faces pivoting on the opposite end of the pawl out toward the periphery of the roller. Campbell's is a sliding motion in and out of engagement necessarily on a line with the face of the engaging parts, while the engaging parts are at right angles in Hartshorn's, standing nearly vertical to the axis of the roller. There may be a sliding of parts in Hartshorn, but not like that of Campbell.

30 X Q. What does Hartshorn mean in the last clause of his claim of the reissue where he says: "And acting substantially at right angles to the ratchet or notched hub"?

A. He means that the engaging part in its action moves and holds at right angles with the engaging part of the ratchet or notch as distinguished in acting or moving in a parallel line with the engaging part.

31 X Q. Does not Hartshorn mean in the quotation in the former question that the pawl moves to and from the ratchet or notched hub in a plane which is at right angles with the axis of the ratchet or notched hub?

A. Undoubtedly he means that, too. At all events, that is true when you view the ratchet in the longitudinal direction of the spindle on which it is mounted.

158 32 X Q. Do the pawls in the Campbell patent move to and from the flattened or notched shaft in a plane at right angles to the axis of such shaft?

A. Yes.

33 X Q. Having the Campbell patent before him, was it any invention in Hartshorn to substitute a hinged pawl for the detents used by Campbell?

Question objected to, as it recites but part of the condition of the Hartshorn patent.

A. I think so. It is a different construction and operates differently, as I have explained, and a construction not suggested by the Campbell patent any more than a sleigh that slides suggests a wheel that revolves on an axle.

34 X Q. Then, if it required invention to put a pivoted pawl in the place of the Campbell pawl, does a device which uses a pivoted pawl infringe, in your opinion, the Campbell patent?

Question objected to as a false assumption from the last answer.

A. That depends on other circumstances. If the conditions in the question were all the conditions I should say no. But the claim in the Campbell patent in this controversy is for a pawl and ratchet of a character which not only engage and hold or not by the manipulation of the curtain when in the brackets, but for such a construction of arrangement as will perform the function of locking the roller against the force of the spring, securing a fixed relation with the roller spring and spindle when the roller is removed from the bracket—in the words of the claim—"so that when the roller is removed from its brackets the tension of the spring will be preserved." I think that although the conditions in the question were had in the supposed construction that claim would be infringed.

35 X Q. Will you look at the Campbell reissue, first claim,
159 and also at the Campbell original, and state if you find the invention claimed in the first claim of the reissue claimed in the original?

A. It is not.

36 X Q. Does the first claim of the Campbell reissue cover the hinged pawl when used in place of the bolts and pins as shown in the Hartshorn reissue 7370?

A. I think it does.

37 X Q. Did the claim in the Campbell original cover the use of

the pivoted pawl in place of the pins or bolts as shown in the Hartshorn reissue 7370?

A. I don't think it did, but I think the invention of Campbell embraced that construction, as set out and divulged by the Campbell original patent.

38 X Q. If the Smith English patent fixture should be shown to have a pawl or detent and ratchet so made and arranged as to allow the shade to be drawn down or run up, and which engage automatically with each other by the manipulation of the curtain alone, and without auxiliary device to hold the shade in any position, and which would lock the spring and prevent it from being unwound or untwisted when taken from the brackets, would it then anticipate the first claim of the Campbell reissue 7367?

A. If the Smith curtain fixture could be shown to be of the construction, combination, and operation suggested in the question, and the trigger removed from the pawl, and the bracket open, so as to allow ready removal of the roller therefrom, and found to operate practically, then I should say it would anticipate the first claim of the Campbell patent.

39 X Q. In your direct examination you stated that you disagreed in the opinion of Dr. Hagan, the defendant's expert, in relation to the operation of the Smith English patent, and that in your opinion he was mistaken. Was your opinion, so expressed, founded upon inspection of the Smith patent, on theory, or was it the result of experiment?

A. First, on the inspection of the patent and my own judg-
160 ment of the operation of the contrivance as described and shown in the Smith patent, which it seemed to me very clear (irrespective of my general or theoretical knowledge of the operation of such mechanical parts) that it was never contemplated by Smith, or intended, that his construction should operate in the manner Dr. Hagan concluded it would; for, if that had been the case (it struck me when Dr. Hagan was giving his testimony) Smith would never have added the trigger to the pawl, nor cord, nor the weight of the cord and tassel, for the purposes he states they are to be employed; nor would he have made the ratchet as he did, nor would he have employed the pawl-spring, nor would he employ the closed bracket as he did.

Adjourned to November 3, at 11 a. m.

New York, *November* 3, 1882.

Met pursuant to adjournment.
Present: Counsel as before.

Cross-examination of S. P. Kittle continued:

(Last answer continued:) I have also had a fixture made in pursuance of the Smith patent, and applied a curtain to the roller, and find, by experiment, the operation of the Smith fixture entirely different from that attributed to it by Dr. Hagan, and necessarily so.

S. P. KITTLE.

Subscribed and sworn to before me.

S. NELSON WHITE,
Examiner, &c.

161 STEWART HARTSHORN, a witness of full age, being called on behalf of complainant and duly sworn, in answer to interrogatories propounded to him by S. D. Law, Esq., of counsel for complainant, deposes and says:

1 Q. What is your name, age, residence, and occupation?

A. Stewart Hartshorn; I am forty-two years of age; I reside at Short Hills, Milburn, New Jersey, and am a manufacturer of shade-rollers.

2 Q. Are you the complainant in this suit?

A. Yes, sir.

3 Q. Look at the letters patent No. 68502, granted September 3, 1867, and state whether you are the same person to whom these letters patent were granted.

A. I am.

4 Q. That patent describes the attaching of the pawl and ratchet or notched hub to a spring shade-roller or to parts connected therewith in such a manner that the tension of the spring would be preserved when the roller was removed from its brackets or bearings, as well as when the roller was resting in the bearings; at the time you made your application for the patent 68502 and obtained the same, did you believe yourself to be the first and original inventor of that mode of attaching the pawl and ratchet to accomplish that purpose?

A. I did.

5 Q. In the reissue of said patent 68502, which reissue is 7370, and was granted October 31, 1876, and applied for May 27, 1875, as appears from the said reissue, you disclaim generally in said reissue the arrangement of the pawl and ratchet upon or connected with the roller, so that the roller can be disconnected from its brackets without permitting the spring to unwind, for the reason as stated in said disclaimer; that you believe such arrangement of pawl and ratchet had been known to William Campbell prior to your 162 invention thereof, and as shown in the letters patent granted to him September 24, 1867 (No. 69176); state how you became aware that Campbell had invented that arrangement of pawl and ratchet effecting such a purpose before your invention of the same arrangement, and when you learned that fact.

A. During the year 1873 a suit was brought at Boston, in Massachusetts, by the Salem Shade-Roller Company at that time, against Mr. William G. Harris, of Boston, who was selling my rollers. This suit was brought under the David patent (exhibit David patent), and I sought to defend Mr. Harris, and as the question of priority of invention was involved of a feature that was common to their David patent and the patent of my own, 68502, and to the Campbell patent, No. 69176, I called upon Mr. Campbell, the owner and patentee of the Campbell patent, to learn at what time he made his invention. He told me at that time that he believed the invention was as much as a year previous to his patent or the application therefor, and inasmuch as my invention was made about the time as I could remember of the application for my patent, I purchased Mr. Campbell's patent of him.

6 Q. Was Campbell's invention set up in the answer in the suit against Harris, as anticipating the patent or invention of David, upon whose patent that suit was brought?

Objected to on the ground that the answer is the best evidence.

A. I believe it was.

7 Q. When did you purchase the Campbell patent from William Campbell, patentee?

A. I refer to the assignment to me, which gives the date the 13th day of February, 1874.

8 Q. Was Mr. Campbell called as a witness on the part of the defendant in that suit, to prove the time of his invention, as shown and described in his patent?

163 A. He was.

9 Q. Was you present when Mr. Campbell was examined as a witness in that case?

A. I was present.

10 Q. State at what time Mr. Campbell fixed the date of his invention, as shown in his said patent, when he was so examined.

Defendants' Counsel: I object to this question because it is hearsay evidence, and that the record in said case is better evidence than this.

A. As early as the 1st of May, 1867; early as that to a certainty; perhaps earlier.

11 Q. Was the time of Mr. Campbell's invention, as fixed by him in his testimony, earlier or prior to the time when you made your invention, as described in your patent 68502?

A. It was earlier.

12 Q. Was the fact that Mr. Campbell's invention, as shown and described in his patent 69176, granted September 24, 1867, was made earlier than you made your invention, described in the letters patent 68502, granted September 3, 1867, the reason why you applied, in May, 1875, for a reissue of your patent and for a reissue of the Campbell patent?

A. It was the reason.

13 Q. Were the applications for the reissues of said patents made at the same time?

A. They were—as appears from the patents themselves.

14 Q. Previous to the time when Mr. Campbell gave his evidence as to the time of his invention, as before stated, had you any definite and certain knowledge as to the time when Campbell actually made his invention?

A. I had not.

Cross-examined:

15 X Q. When did you make the invention claimed in the reissue patent No. 7370?

164 A. It was within two or three days, as near as I can remember now, of the application for the original patent 68502 through Munn & Company, I believe.

16 X Q. When did you make that application for the original patent?

A. I will have to refer to record. I know only that I applied for the patent almost as soon as the invention was perfected—as the model was perfected. I find the date of application in the file-wrapper in the case to be August 2, 1867, under the note received.

17 X Q. How long before that time did you take your model to the person who acted as your solicitor in obtaining that patent?

Q. That I do not know to a day. It seems to me that it was at least several weeks before the issue of the patent. I merely connect the issue of the patent with the time of application in my mind. All that I can remember with certainty is that I was anxious to obtain a patent as soon as I made the invention, and I endeavored to do so. I know it was a considerable time after the 1st of May, 1867.

STEWART HARTSHORN.

Subscribed and sworn to before me—

S. NELSON WHITE,
Examiner, etc.

Complainant's counsel also puts in evidence an extract from "Knight's American Mechanical Dictionary," Vol. I, page 690, as follows:

"Detent.—A pin, stud, or lever forming a stop in a watch, clock, tumbler-lock, or other machine. It is variously called in specific cases; as click, pawl, dog fence, etc."

Adjourned *sine die*.

165 U. S. Circuit Court, East. Dist. Mich.

STEWART HARTSHORN *vs.* SAGINAW BARREL CO. and Others.

It is hereby consented and stipulated that the admission of defendants, found on page 4 of the record, folio 16, may be amended by adding thereto at the end thereof the words: "And after the dates of the patents sued upon."

It is also consented that the complainant may put in further testimony to prove the construction of the roller sold by the defendant in the suit of "The Salem Shade Roller M'f'g Co. *vs.* William G. Harris," decided in Massachusetts in 1875, and the record in which suit has been put in evidence in this cause.

Dated Dec. 18, 1882.

SPRAGUE & HUNT,
Def'ts' Sol'rs.

NEW YORK, *January* 3, 1883.

Further testimony on the part of the complainant put in under foregoing stipulations.

Stewart Hartshorn being recalled, in answer to further interrogatories propounded to him by S. D. Law, deposes and says:

Int. 1. On your previous examination as a witness in this cause,
taken on the 3d day of November, 1882, you referred to a
166 suit which was brought in the U. S. circuit court for the dis-
trict of Massachusetts, in 1873, for an infringement of the
David patent ("Exhibit David Patent") by the Salem Shade Roller Co. against one William G. Harris, who was selling your rollers, and which suit was defended by you; state what was the construction of the roller which you made at that time, and which said Harris was selling at the time of the commencement of that suit against him.

Ans. The roller was a spring-roller and had the pawl pivoted to the cap or cup which was on the end of the roller, and revolved with it. The ratchet or notched part, with which the pawl engaged, was on the stationary part of the spindle, and the pawl engaged with it in the slow revolution of the roller; the pawl was thrown away from the ratchet in the rapid revolution of the roller, and was thus kept from engaging with the ratchet, except when the revolution of the roller was checked or made slower.

Int. 2. Produce, if you have them, any rollers of the construction you have described in your last answer which were made by you and such as were sold by said Harris at the time said suit was commenced against him.

Ans. I produce two rollers, which are of the construction just described by me, and which are alike in construction, except that one has but a single pawl, while the other has two pawls. These rollers have attached to them tags marked "S. S. R. M. Co. *vs.* Harris, Complainant's Exhibit, No. 2, N. A. P., Ex'r," the other being marked with the same letters and words, except that it is marked "Exhibit No. 3."

Int 3. For how long before the commencement of the Harris suit referred to had you been making and selling rollers constructed like those you have now produced and such as you have described?

Ans. For two or three years.

167 Int. 4. How long did you continue to make and sell
rollers like those produced by you after the Harris suit was
brought?

Ans. Until about or a little after the time when the Harris suit was decided against him and in favor of the Salem Shade Roller Co., sustaining the David patent, and holding that the roller sold by Harris was an infringement of that patent.

Int. 5. During the time you have mentioned—that is, from two or three years before the commencement of the said suit against Harris down to the time when that suit was decided against Harris—did you make and sell any pawl-and-ratchet rollers having any different construction and arrangement of pawl and ratchet than such as you have described, and such as is shown in the rollers produced by you?

Ans. No, not during that period.

Int. 6. Are you positive that the rollers which you sold to Harris, and for the sale of which by him said suit was brought against him, were of the same construction as the rollers now produced by you?

Ans. I am. I identify the rollers now produced by me as my manufacture, and know that they are of the same construction as the rollers which I sold to Harris.

The rollers produced by the witness are put in evidence, and are marked "Complainant's Exhibits Harris Rollers, No. 1 and No. 2, S. N. W., ex'r."

STEWART HARTSHORN.

Sworn to before me—

S. NELSON WHITE,
Examiner, etc.

Stephen D. Law, a witness called on the part of the complainant, being duly sworn, says:

I am one of the solicitors for the complainant in this cause. I have been for many years the counsel of Stewart Hartshorn, the complainant, as to matters and suits relating to the letters 168 patent for shade-rollers granted to and owned by him, and was employed by said Hartshorn to defend the suit referred to in his testimony, brought in the U. S. circuit court for the district of Massachusetts by the Salem Shade Roller Manufacturing Co. *vs.* William G. Harris in the year 1873 and decided in December, 1875, and conducted all the proceedings on the part of the defendant in that cause. A certified copy of the record in that suit against Harris has been put in evidence in this cause.

The exhibit rollers put in evidence in said Harris suit by the complainant therein, and marked "Complainant's Exhibits No. 1," "No. 2," "No. 3," and "No. 4" (Harris' record, pages 11 and 12), and as to which the admission of the said defendant Harris, found in page 17 of said "Harris' record," was made, have been lately, within the last month, withdrawn, by the consent of the parties in said suit, from the files of the court in which said suit was brought and decided (the said suit and all matters connected therewith having been settled), and sent to me by the clerk of said court, and have since then been in my possession, and are in the same condition in which they were when so sent to me.

The two rollers produced by the witness Hartshorn in his examination in this cause and put in evidence therein, and marked "Complainant's Exhibits Harris Rollers, No. 1" & "No. 2," are two of the rollers put in evidence, as above stated, by the complainant in the said suit of the Salem Shade Roller M'f'g Co. *vs.* Harris, and marked "Complainant's Exhibits No. 2" & "No. 3," in said suits, and which were sent to me by the clerk of the court in which said suit was heard, as above set forth.

The other two rollers, exhibits of complainant in said Harris suit, and marked "S. S. R. M. Co. *vs.* Harris, Complainant's Exhibits No. 1" and "No. 4," "N. A. P., ex'r," are in my possession. The roller "Exhibit No. 1" is a large, long tin roller, but has the 169 same construction and arrangement of pawl and notched spindle as is found in the roller produced by Hartshorn, and marked "Compt's Exhibit Harris Roller, No. 2," except that the spindle is notched or recessed for receiving the pawl only on one side. The other roller, "Exhibit No. 4," is a wooden roller, the spindle of which is notched or recessed on opposite sides, but the cap or cup and the pawl pivoted thereto, which was fixed to the end of the roller, have become detached and lost.

From my connection with the suit of the Salem Shade Roller M'f'g Co. *vs.* Harris, as solicitor of the defendant therein, and my knowledge of the exhibits in said cause, and of the rollers sold by the defendant, for which acts said suit was brought, I am positive that the two rollers above referred to, produced by the witness Hartshorn, are the identical rollers put in evidence by the complainant in the said suit against Harris, and the sale of which was admitted by said Harris, as set forth in the "Harris record," as above mentioned.

The two other rollers above referred to, marked "S. S. R. M. Co. *vs.* Harris, Complainant's Exhibits No. 1" and "No. 4," now in my possession, will be produced on the hearing of this cause if desired by the defendants.

S. D. LAW.

Subscribed and sworn to before me—

S. NELSON WHITE,
Examiner, &c.

170 & 171 At a stated term of the circuit court of the United States of America for the southern district of New York, in the second circuit, held at the United States court-rooms, in the city of New York, on the 15th day of May, in the year of our Lord one thousand eight hundred and eighty.

Present: The Honorable Samuel Blatchford, circuit judge.

Order for Preliminary Injunction.

STEWART HARTSHORN *vs.* CHARLES FLOSS.

On reading and filing the bill of complaint in this cause, alleging the infringement of reissued patents Nos. 2756 and 7367, for improvements in shade-rollers, and the exhibits attached thereto, and the affidavits of J. H. C. Neviuss, Stewart Hartshorn, and S. P. Kittle, on the part of the complainant, and the affidavit of the defendant, Charles Floss, in his own behalf, and, after hearing S. D. Law on the part of the complainant and Arthur P. Hinman on the part the defendant—

Ordered, That an injunction issue according to the prayer of the bill to restrain the defendant, Charles Floss, his agents, servants, and workmen, from making, using, or vending to be used shade-rollers employing or using in their construction the invention or arrangement of parts described and claimed in the said reissue No. 2756 and in the first and second claims of the said reissue No. 7367 until the further order of this court.

(Signed) SAM'L BLATCHFORD.

A true copy.
[L. S.] J. M. DEUEL.

172 At a stated term of the circuit of the United States for the southern district of New York, in the second circuit, held at the court-rooms thereof, in the city of New York, on the 31st day of May, 1881.

Present: Hon. Samuel Blatchford, circuit judge.

STEWART HARTSHORN *vs.* CHARLES FLOSS.

A decree having been duly entered in this cause on the 10th day of August, 1880, by which it was ordered, adjudged, and decreed that a perpetual injunction issue against the said defendant, Charles Floss, restraining him from infringing complainant's patents, reissue No. 2756 and the first and second claims of reissued patent No. 7367, for improvements in shade-rollers, on which said patents this suit was brought, and an injunction having been issued in pursuance of said decree, and the same having been returned and the return filed, and it appearing therefrom that said injunction was duly served on said defendant, Charles Floss, on the 24th day of August, 1880, which injunction commanded and enjoined the said defendant, his attorneys, agents, servants, and workmen, and each of them, to forthwith and forever to refrain and desist from making, using, or vending to others to be used, in violation of said patents, any shade-rollers containing the improvement described and claimed in reissue 2756 and in the first and second claims of reissue No. 7367.

Upon reading and filing notice of motion in this cause, and
173 proof of service thereof on the defendant, Charles Floss, for
an attachment against him, the said Charles Floss, to compel him to appear before this court to answer for his contempt in violating the said injunction; and upon reading and filing on the part of the complainant the affidavit of Stewart Hartshorn, the complainant, Edward Winter, John H. C. Neviuss, Nelson Griffen, William T. Smith, and S. P. Kittle, and papers accompanying said notice, and affidavit of said Charles Floss, read in opposition thereto, and after hearing S. D. Law, of counsel for complainant, and A. D. Hinman, counsel for defendant—

Upon consideration, it is ordered, adjudged, and decreed that said defendant, Charles Floss, is in contempt of this court, and has violated the said injunction, in that the said defendant has, since the service upon him of said injunction, made, used, and sold shade-rollers containing and embodying the inventions and improvements substantially like and the equivalent of those shown and described and claimed in said reissue No. 2756, and shown and described and claimed in the first and second claims of said reissue No. 7367; and it is further ordered that a writ of attachment issue against the said defendant, Charles Floss, directed to the marshal of the United States for the southern district of New York, commanding him to attach the body of the said Charles Floss, and produce the same before this court, at a term thereof to be held at the United States court-rooms in the city of New York, on the 1st day of June, 1881, at the opening of the court on that day, then and there to answer for the breaches of the defendant of the injunction heretofore issued and served on the defendant herein, and for such other matters as shall be laid to his charge, and to abide by and perform such other and further order as may be made in the premises, and that on said writ of attachment said defendant make and deliver to this court his bond, to be approved by the court, in the sum of five hundred dollars, payable to the complainant in this suit, his executors, 174 administrators and assigns, conditioned that said defendant, Charles Floss, will at once and forever hereafter cease his infringement in any manner of said patents, reissues Nos. 2756 and 7367, or either of them, and that on the approval of such bond by the court the said defendant be released from the custody of the marshal under said attachment.

And it is further ordered that it be referred to John A. Shields, Esq., as special master, to take proof as to the extent of such infringement by the defendant, and of the violation of said injunction, and of the damages, costs, and expenses caused to the complainant thereby, including the costs of this proceeding, and that he report the same to this court with all convenient speed.

(Signed) SAM'L BLATCHFORD.

A copy.
[L. S.] J. M. DEUEL, *Clerk.*

175 In the United States Circuit Court for the Eastern District of Michigan. In Equity.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, and REUBEN KIMBALL.

Testimony of witnesses produced by the defendants, taken under the 67th rule in equity, as amended—present: S. D. & J. T. Law, counsel for the complainant; and Messrs. Sprague & Hunt, of counsel for the defendants—before Henry S. Sprague, a notary public in and for the county of Wayne and State of Michigan, taken in pursuance of the annexed notice.

176 The defendants' counsel put in evidence a curtain-shade roller, marked "United States Circuit Court, Eastern District of Michigan. Stewart Hartshorn *vs.* Saginaw Barrel Company and Others. S. N. W., ex'r, March 21st, 1882;" defendants also put in evidence the patent No. 68502, dated September 3rd, 1867, to Stewart Hartshorn, marked "Defendants' Exhibit Hartshorn Original Patent," H. S. Sprague, notary public; they also offer in evidence letters patent reissue No. 2756, dated August 27th, 1867, being a reissue of letters patent No. 44624, dated October 11, 1864, issued to Stewart Hartshorn, and marked Defendants' Exhibit "Hartshorn's First Patent," H. S. Sprague, notary public; defendants also put in evidence patent No. 69176, dated September 24th, 1867, and issued to William Campbell, being the original patent which was reissued as No. 7367, dated October 31st, 1876, and issued to William Campbell, assignor to Stewart Hartshorn, Defendants' Exhibit Campbell Patent,

H. S. Sprague, notary public; the defendants offer in evidence English letters patent granted to Edward Smith December 16th, 1848, No. 12375, marked Defendants' Exhibit Smith's English Patent, H. S. Sprague, notary public; defendants offer in evidence English letters patent granted to David Davis November 15th, 1854, No. 2416, marked Defendants' Exhibit Davis English Patent, H. S. Sprague, notary public.

WALTER B. NOYES, the first witness produced on behalf of defendants, after being duly sworn, testified as follows:

Direct examination by Mr. HUNT:

Q. 1. What is your name, age, residence, and occupation?

177 Ans. My name is Walter B. Noyes; I reside in Saginaw, Michigan; I am forty-six years old, and am a mechanic by profession.

Q. 2. What is your present business?

Ans. I have been engaged in the manufacture of shade-rollers for about six years; previous to that I was largely engaged in manufacturing machinery of different kinds, and had taken out and had granted to myself some twenty different patents on mechanical movements.

Q. 3. Will you look at the Defendants' Exhibit Smith's English Patent, and state whether you understand the same.

Ans. I have had my attention called to Smith's English patent, and do understand the same.

Q. 4. Did you make a fixture in accordance with the specification and drawing of that patent? And, if so, will you produce it?

Ans. I have made a curtain fixture in accordance with Smith's English patent, and produce it.

(Defendants offer in evidence the model spoken of in the answer above, marked Defendants' Exhibit Model Smith's English Patent, H. S. Sprague, notary public.)

Q. 5. Is this model made in accordance with the Smith English patent?

Ans. This model is made in accordance with the Smith English patent; I confined myself strictly to the drawing.

Cross-examination:

Q. 6. Is there any difference, in any particular, between the Exhibit English Patent and the model you have just produced, and which is marked Model Smith Patent?

178 Ans. Not in mechanical construction.

Q. 7. Is there any other difference; that implies there is a difference in something else.

Ans. There is no difference between the two.

Q. 8. You say you confined yourself strictly to the drawing; did you, in the making of that patent, refer to any other part of the patent other than the drawing?

Ans. I did not.

Q. 9. In making that model, did you refer to all the different figures of the drawing?

Ans. I did not refer to all the different figures.

Q. 10. Refer to the drawing attached to the Exhibit English Patent, and point out which, if any, of the figures making a part of that drawing were referred to by you, and which of such figures are not illustrated in the model you have produced?

Ans. Figure 4 is the drawing that I constructed the model from; all the other figures of the drawing are not illustrated in the model I produce.

William E. Hagan, the next witness produced on behalf of the defendants, testified as follows, in answer to questions propounded by Mr. Hunt:

Q. 11. What is your name, age, residence, and occupation?

Ans. My name is William E. Hagan; I reside at Troy, New York; am 56 years old, or thereabouts; my occupation is that of a mechanical and chemical expert.

179 Q. 12. You will state what has been your experience and qualifications as such chemical and mechanical expert.

Ans. I was educated as a chemist and spent 20 years of my life as such, and for the last 18 years of my life a large portion of my time has been taken up in the examination of machinery and mechanical inventions of various kinds as employed in the arts; I have also acted as solicitor of patents to quite an extent during the last 15 years, and have frequently been called upon to give evidence in court where inventions in machinery were a matter of legal controversy.

Q. 13. Have you read the Hartshorn reissue 7370, and do you understand the construction of the devices therein described; and, if so, will you please explain them?

Ans. This patent relates to a method of utilizing a torsional spring, arranged within the hollow portion of a curtain-roller, so that it will roll up the curtain, and this method consists in the manner of utilizing a pawl and a notch arranged upon the hub; the hub of which is stationary and the pawl attached to a rotating disc upon the moving part of the roller. The hub, which engages with the pawl, is arbitrarily constructed with a notch upon its top to engage with this pawl to arrest the motion of the roller at that point. As constructed, when the roller is moved rapidly, and with it the pawl attached to the moving part of the roller, the pawl slips over the notch, and does not engage with it; when allowed to rotate slowly the pawl falls, and when the roller comes around to the point where the notch is, at the top of the hub, the pawl engages with it
to arrest the rotation, as I have before described. The draw-
180 ing down of the curtain and consequent movement of the
roller acts against the torsion of the spring, and the engagement of the pawl and hub, which I have before described, according to the measurement of the velocity with which it is moving, engages with the hub to arrest the motion or to allow it to pass over.

Q. 14. Have you examined the Campbell patent reissue 7367, and do you understand the construction of the devices therein described; and, if so, will you explain them briefly?

Ans. This device, like the Hartshorn device I have already described, is made to utilize the torsional effect of a spring placed within the roller, and to regulate the distance at which the curtain shall be run up by the force of the spring, or pulled down against it by the arrangement in the end of the roller of two sliding pins, which engage with the flat side of the stationary part of the roller when the roller is moved slow enough for them to engage with it and which slip over it, and do not engage with it when the roller is moved rapidly.

Q. 15. Have you examined the Jacob David patent No. 69189, and do you understand the construction of the devices therein described; and, if so, will you briefly explain them?

Ans. Like the two former devices which I have before described, that shown in the David patent also relates to a manner of using a torsional spring placed within the curtain-roller and a mechanical means for regulating the distance at which the curtain shall be pulled down against the force of the torsional spring within the roller, and the distance to which it may be rolled up by the torsional force of a spring, and this mechanism consists of a hinged stop-lever attached to the curtain-roller, arranged to move around a slot formed in the bracket, in which the stationary part of
181 the roller is put, so that when the roller is moved slowly and the stop-lever is over the slot in the bracket it will drop into the latter and detain the motion of the roller; but when the roller is moved rapidly this stop-lever will pass over the slot in the bracket, so as not to engage with it.

Q. 16. Have you examined the Hartshorn patent reissue No. 2756, being a reissue of the original letters patent No. 44624, dated October 11, 1864, marked Defendants' Exhibit Hartshorn's First Patent, and do you understand the construction of the devices therein described; and if so, will you briefly explain them?

Ans. This device relates to the same class of devices as the others I have described, in the fact that it is constructed to use torsional force of a spring in the same manner, with the exception that the pawl is not attached to the moving part of the roller, but attached to the bracket and arranged to engage at the top of the roller-hub, with notches oppositely formed in the latter. The measure of velocity at which the roller is moved up or down regulates the engagement of the pawl and notches in the roller, as in the other devices that I have described, from the same causes.

Q. 17. Have you examined English letters patent 12375, dated December 16, 1848, issued to Edward Smith, and do you understand the same; and, if so, will you explain what the devices are which are shown in the patent particularly relating to window-shade curtains?

Ans. I have examined the patent named in the question, and those portions of it to which the question more particularly relates. The invention is described as a method of using a torsional spring

for various purposes, and, among others, for operating a
182 curtain or window-blind, as it is termed, in which the curtain
is pulled down from off the roller against the torsional force of the spring placed within the hollow roller, and in which the curtain is rolled up by the force of the spring. The devices shown at figures 1, 4, 5, and 5A illustrate the mechanism to which I refer more particularly. The movement of the curtain upon the roller is regulated by means of a hub, which is ratcheted, and a pawl arranged to engage with such ratchet-teeth upon the hub in the following manner, and which I quote from the patent, as follows: "A is the roller, which is composed of two parts, A1, A2. A1 is a solid cylinder of wood (or it may be of any other suitable material), and A2 a metal tube, which is affixed to one end of A1, which is recessed at that end for its reception, so that both parts of the roller may be externally in one straight line. C is a wooden plug with metal cap, *Ca*, which is inserted into the outer end of the tubular part A2. D is a rachet-wheel, which is affixed to the outside of the cap *Ca*. E is a box which contains the spring and short arm of the pawl or click F, Fig. 5*a*, and is fitted upon the ratchet-wheel by means of a fixed spindle, D*a*, which passes through the center of the ratchet-wheel, and also through the caps *Ca* and plug C, and extends a little way beyond the latter into the interior of the tube A2. The spindle D*a* projects at its outer extremity through the box E, and terminates in a square piece, which fits into a corresponding aperture in the bearing-bracket G1 (neither the box nor spindle being intended in any case to revolve). *Cb* is a cap attached to the outer end of the part A1 of the roller, and has a short spindle, D*b*, which takes into a circular hole in the bracket G2. The axes, therefore, upon which the
roller revolves are the spindle D*a* at one end (when the ratchet
183 wheel is released from the pawl) and the spindle D*b* at the
other, only that in the former case the roller turns around the axes, while in the latter the roller and axes revolve together. H is the torsion-spring, which consists of a fixed strip of vulcanized rubber enclosed within a tubular piece, A2. At one end this spring is made fast to a block or plug inserted into the inner end of the tube and the other end to the fixed spindle D*a* of the click-box E. When the roller is pulled round and the blind drawn down, an operation to which the click F offers no resistance, the revolution of the roller causes necessarily a twisting or torsion of the strip of vulcanized India rubber, because one end only (the inner end) revolves with the roller, while the other (that attached to the spindle D2) is fixed. The moment, however, the click is released the powerful tendency which the torsion spring has to return to its original position comes into full play and causes the roller to revolve in the contrary direction, and thereby raises the blind." I now quote from the patent a part preceding the last, in which the inventor, Smith, declares as follows: "I desire it may be understood that I prefer in all cases making the said torsion-spring of vulcanized India rubber as being a more permanently elastic material than any other with which I am acquainted and much less liable to get out of order, but that they may be made also of strips of metal, or of metal wire, or of whalebone, or of cat-

gut, and of various other substances more or less elastic or pliable. I do not, therefore, restrict myself to the employment of any particular substance in the construction of the said springs." In the statement of invention one of the improvements named in the patent is stated in the following text: "The first consists in dispensing
with the spring ordinarily used to press the pawl on the ratchet-
184 wheel, which controls the action of the roller. I effect this
by weighting the short or inner end of the pawl, as shown in figure 1 of the annexed drawings, so that when it is desired to cause the pawl to catch into the teeth of the ratchet it is only necessary to relieve it of part of the weight of the cord and tassel by holding it up by the hand." From the quotations that I have made it appears that the curtain-roller was operated to unroll the curtain against the torsional spring, and the measure of its motion was regulated by means of a ratcheted hub that moved with the roller and a pawl constructed to operate in a stationary cap or disc, so that when the curtain was moved rapidly the pawl would overrun the ratchet so as not to engage with it, but when moved slowly the pawl would drop into the ratched hub, engage with it, and so stop the revolution of the roller. As thus constructed the roller could be taken out of the bracket and removed therefrom without unrolling the roller or disturbing the parts in the least; all the effort necessary to do it would be to take the roller from out of its bearings, one of which was a stationary bearing in the bracket and the other one of which revolved in the opposite bearing in the bracket.

Q. 18. Will you examine Defendant's Exhibit Model Smith's English Patent and state if you find it constructed in accordance with Smith's English patent, and describe the operation of the said model?

Ans. It operates as I have before described, and I find also that it operates equally well to draw up the curtain and to have its ascent arrested at any time by means of the pawl and ratchet without using the cord attached to the pawl by allowing the curtain to run up
pretty rapidly by the force of the spring, so that the pawl rides
185 over the ratchet without engaging with it, and that the roller
and spring are easily checked by reducing the speed of motion in about the same manner in this respect that other curtain fixtures do, without the use of the cord, by handling the curtain alone. I have examined the model named in question and believe that it is constructed fairly and correctly according to the specifications and drawing of the English Smith patent named in the question.

Q. 19. Have you examined the English letters patent granted to David Davis, November 15th, 1854, No. 2416, marked "Defendants' Exhibit Davis English Patent," and do you understand the same, and will you explain briefly the manner in which the device is caused to revolve and to be checked in its revolutions, as shown in the specification and drawing of said patent?

Ans. I find on examination of the patent named in the question that it consists of a tube to contain a torsionally-acting spring attached at one end to an interior rod. This spring is used to actuate an exterior roller to roll up the curtain. The description of the method by which this spring operates to so do is described as fol-

lows: "B is a pulley with the usual pawl and ratchet and the trigger or detent C; D is an end pulley running free upon the axle A, and E is a coil-spring, one end of which is fastened to the pulley B, and the other end to the axle A; F is an elastic tube or governor of caoutchouc or other suitable material, the ends of which are attached to the end pulleys B and D." But as to how this device is constructed, so that a curved curtain roller will roll up a curtain, I do not understand; the most that it shows is the statements in the specification that an internal torsional spring is used, and also a
pawl and ratchet and a trigger or detent, C. The trigger or
186 detent C corresponds to that shown in the Smith patent, but
the details of construction by which the "usual pawl and ratchet" are employed to utilize the spring within the curved roller to roll up the curtain I do not understand.

Q. 20. In view of the state of the art as appearing in the English Smith patent, in the English Davis patent, in the older or first Hartshorn patent, and in the Campbell patent No. 69176, what invention, if any, do you find in the Hartshorn reissue 7370?

A. So far as answering to the Davis patent, as stated in the question, and as effecting the state of the art, all there is stated in that patent which is pertinent is that an internal torsional spring is combined with a pawl and ratchet, and the latter spoken of as an ordinary and well-known means for such a use, were in existence at that time. I find, however, in the Smith patent, that, in connection with a hollow roller, a torsional spring had been used, so that the curtain would be unrolled against its torsion and rolled up by its torsion, and the measure of the rotation of the roller to so act had been regulated by a pawl and ratcheted hub which became active or inactive to arrest the rolling up of the roller or its unrolling by the relative velocity with which this rotation of the roller was accomplished. When moved slowly the pawl would descend into the ratcheted hub and arrest the revolution; when moved rapidly the pawl would skip the ratchet so as not to engage with it. I find also that in the English Smith patent that a pawl and ratchet were arranged in connection with a roller and a roller-spring so that the roller can be removed from the brackets without permitting the spring to unwind. I now quote from the Stewart Hartshorn reissue 7370 the following: "The present invention is an improvement on a
shade fixture of this class for which letters patent were
187 granted to me, bearing date October 11, 1864, and reissued
August 27th, 1867, in which the pawl and ratchet or notched hub, designed and used to arrest the rotating of and hold the roller, were arranged to act automatically and in such manner that the shade could be stopped and retained at any desired position or point within the scope of its movement by simply manipulating the shade and varying the speed of the rotation of the roller, and thereby dispensing with the use of side cords or counterpoises. As described and illustrated in such patent, the notched hub was attached to and made a part of the roller, while the pawl was fixed to one of the brackets which supported the roller. In such arrangement, also, of these parts, when the roller is removed from its brackets, the pawl

and notched hub are disconnected and the spring unwinds, which has again to be wound up previous to replacing the roller in its bearings." In view of the prior state of the art, which I have described to exist in the Smith patent, I find that all the purposes accomplished in the later Hartshorn patent, as stated in the quotation made, were accomplished in the older Smith patent, and that the mechanical elements used in the one are also found to exist in the other; hence what invention could exist in the later Hartshorn patent, if any, would exist in the specific manner in which Hartshorn had improved upon Smith; hence I cannot understand the Hartshorn patent to include and cover all ways of arranging the pawl and ratcheted hub, for Hartshorn did not invent these devices, according to the record, neither was he the first man to apply them to a curtain-fixture, and an invention only can exist therein, as I have before stated, in the specific details of construction which he, Hartshorn, employed. I find this difference to exist between the device shown in the Hartshorn reissue 7370, when the latter 188 is compared to the English Smith patent, that in the former the pawl is applied to a disc on the end of the roller, and the hub (so termed) has a notch cut in the top of it, the hub being stationary, while in the Smith patent hub rotates, and the pawl, which engages with the hub, is placed upon a stationary disc fixed to the stationary part of the roller which enters the bracket. Now, how much invention a man would make, after seeing a fixed pawl engage with a rotating ratchet, in changing the position of the ratchet and making it the rotating part and the hub the fixed part, making a mere transposition of these well-known elements apply for this purpose, can hardly be called invention at all, or an act requiring the exercise of creative thought. To me it seems like the exercise of ordinary mechanical skill, and does not rise to the dignity of the term "invention." As regards the older Hartshorn patent named in the question, the elements of a ratcheted hub upon the roller and a pawl upon the bracket were used to perform the same work in connection with the torsional force of a spring, and in which patent these older elements of construction were used in combination with an interiorly-arranged torsional spring, being the same elements, differently arranged from what I have shown and described in the Smith patent, showing that a pawl and ratcheted hub and internal torsional spring were old devices as applied to a curtain. In the Campbell patent named in the question a departure was made from the older Smith and older Hartshorn patents by doing away with the pawls entirely and substituting therefor, as stated in his original patent, and as shown in the drawings, loose or sliding pins or bolts, which move in holes made for them, so as to engage with the sides of the stationary shaft D, around which the spring is wound, and which 189 pins when the roller was rapidly revolved would not engage with the stationary part of the shaft D, but when moving slowly would, and thus arrest the action of the spring and the rotation of the roller. In view of the state of the art as shown in the older English patents which I have named (the older Campbell patent, the older Hartshorn patent), I find the same elements of mechanical construction, some of which differ from the reissue 7370, but all of which tend to limit the area or field in which inventive thought can move, in the combination of a torsional spring within the roller and ratcheted hub and pawl, arranged to regulate the measure at which the torsional spring shall act to roll up the curtain.

Q. 21. In view of the state of the art as disclosed in the English Smith patent, the English Davis patent, and the older Hartshorn patent of 1864, what invention, if any, do you find in the Campbell patent No. 69176?

Ans. In view of the fact that an internal spring had been used to roll up a curtain and roller, I think Mr. Campbell, in substituting for the older pawls, used the sliding pins which I have before described, and in place of pawls he made a departure from the older method, and in that respect made invention.

Q. 22. I will ask the same question as the last with relation to the David patent?

A. I also think that David made a departure in combining his dropping lever *k* with the slot I, formed in the bracket, by which to arrest the torsional action of the spring within the roller.

Q. 23. Will you tell us what a pawl is, and in making your answer have reference also to the pins named in the Campbell original patent, and to the lever *k* in the David patent?

190 Ans. A pawl is a claw pivoted at one end and arranged to allow of the progressional or recessional motion of a ratchet-wheel with which it engages; there are what are denominated push pawls and pull pawls, one kind which engage with a ratchet to hold and arrest its motion, and another to engage with it and move the ratchet-wheel. The pins shown in the Campbell patent are the ordinary pins used in electrical annunciators, and are in no sense pawls; both serve as detents, it is true, and in that sense perform an equivalent office, but they perform it in a different way, in the same manner that a rotary pump pumps water, and so does a piston-pump pump water, and while they both perform the same office they do it differently, and one is not the mechanical equivalent for the other; and for the same reasons the pivoted drop lever in the David patent, which engages with the slot formed in the bracket to arrest the rotation of the roller and the winding up of the curtain, is not a pawl, being merely a detent. What I have termed the jointed or pivoted drop-lever *k* in the David patent would be perhaps better understood in its operation by the functional name of a latch which engages with the slot in the bracket, very much in the same manner as a catch upon a door does with a latch, its operation being to drop on its pivoted end to engage with the other end in the slot, as I have before stated.

Q. 24. Will you compare the original Campbell patent, 69176, with the reissued Campbell patent, 7367, and state whether you find the same invention described and claimed in each of the patents, as to the first claim of the reissue, that being the only one which it is alleged we infringe?

Ans. I find the original patent, as I have before stated, to
191 illustrate and describe the use of pins working in holes in
the "block *b*," with these pins arranged to move in and out

of the holes which I have named, so as to pass over or engage with the "flattened sides of the shaft D, so as to bind said shaft and prevent its revolution;" the object being, as further described, to control the torsional capacity of a spring arranged within the roller against the force of which the curtain is pulled down from off the roller, and by which *the* force the curtain is rolled upon the roller when these pins F do not engage with the flattened sides of the shaft D. As I now examine the Campbell reissue, on the subject-matter of the first claim thereof, a distinct mechanical element, known as such in mechanics, but not described, mentioned, or alluded to in the original patent, is made a part of the claim in the following words: "In a shade-roller having a pawl or detent and a ratchet, or other equivalent, so arranged as to allow the shade to be drawn down or run up, without obstruction, and which engage automatically with each other to hold the shade in any desired position, the arrangement of such pawl or detent upon the roller which carries the notch or ratchet so that when the roller is removed from its brackets the tension of the spring will be preserved." In the original Campbell patent the claim reads as follows: "The combination of the loose or sliding pins or bolts F, having heads formed upon them, with the flattened or notched shaft D, substantially as herein shown and described, and for the purposes set forth." I find on a comparison of the two claims thus quoted that the claim of the reissue has added to it something which did not occur in the claim of the original patent—was not mentioned or illustrated in it—the interpolation or addition being a pawl or ratchet; I therefore find that the reissue patent has
192 not been expanded in that sense, and in the fact that it includes matter and elements made no part of the original patent or its claim, and an entirely different method of operating a detent to check the motion of the roller.

Q. 25. Will you compare the original letters patent to Stewart Hartshorn, No. 68502, with the reissued patent No. 7370, and state if you find any illustration made either in the drawings or in the claims of said patent?

Ans. I find on examination of the reissue named in the question, 7370, that a drawing has been added to it which does not occur in the original Hortshorn patent 68502; this added drawing is named as figure 3 of the reissue. I find also the following to occur in the reissue 7370: "In the accompanying sheet of drawings figure 1 is a longitudinal central section of a roller employing my invention, taken on the line *x x* of figure 2; figure 2 is a transverse section of the same, taken on the line *v v* in figure 1; and figure 3 is an end view of such roller, showing the flattened end of the spindle, and in dotted lines the position of the pawl and notched hub." Figure 1 is shown as section of figure 3, but not of figure 2, the line *x x* being placed upon the interloped figure, and left off the figure 2 as occurring in the original patent, figure 3 being merely a view of the disc attached to the end, but not a view of the disc and roller. I do not find any other differences in the drawings.

Q. 26. Assuming that the pins and flattened sides of the shaft D, shown in the original Campbell patent, 69176, are the pawls and ratchets, as termed in the reissue 7367, how much invention do you find in the Hartshorn reissue 6370, and state your reasons for such opinion?

193 Ans. If we assume that the loose or sliding bolts or pins F are pawls, and the flattened sides of the shaft D a ratchet (as shown in said original patent), there can be no invention whatever in the Hartshorn patent, from the fact that if these pins are pawls and the flattened side of the shaft D in the original patent is a ratchet, and these pins representing pawls, as assumed, are on the roller to move with it, and engage with the stationary shaft D to arrest it, then the Hartshorn device embodies the same construction, with this exception, that it uses but one pawl instead of two, as assumed in the Campbell; therefore if the pins in the Campbell patent can be interpreted to mean pawls and the flattened side of the shaft D, with which these pins engage is a ratchet, it certainly would include and cover the pawl arranged upon the moving roller and the notched stationary hub to which the spring attaches (as shown in the Hartshorn reissue 7370); hence I conclude that if the assumption named in the question is correct, the Campbell patent is for the same invention as that described in the Hartshorn reissue named in the question.

Q. 27. Will you examine Complainants' Exhibit Saginaw Barrel Company's Roller, No. 2, and state in view of the state of the art as appearing in the English Smith patent, English Davis patent, and the first Hartshorn patent of 1864, and the Campbell patent No. 69176, whether we make a device which is covered by any claim in said reissued patent No. 7370 which is not shown in some of the patents above recited.

Ans. In view of the state of the art as shown and exemplified in the Record, and as shown in the older patents named in the question, and to which I have referred in my former testimony, the field in which invention could move in the use of a pawl and rat-
194 cheted hub to regulate the torsional resistance of a spring placed within the roller to work the latter would be necessarily limited to the specific construction employed from the fact that these same elements themselves had all been used before to accomplish the same result. I do not think myself, in view of these older patents named, that there is any invention in the subject-matter of the claim attached to the patent reissue 7370, and I am of the opinion that the defendants' roller named in the question is made with as much of an advance upon the existing state of the art at the time the reissue 7370 was granted, and even more than the latter did (the reissue) upon the prior state of the art preceding it. (All that part of the words after 7370 objected to as not called for in the question.) And it is upon these differences that I base the opinion which I give. The device shown in the Hartshorn reissue 7370 shows the stationary hub notched at the top, and so combined that the pawl with the latter could in no way engage with the stationary hub, excepting when the roller made a complete revolution; there was no arrangement by which the revolution of the roller could be arrested or detained, except upon the top of the stationary hub;

the defendants' device, on the contrary, is so constructed that a pawl may engage with the hub at from 6 to 8 points in one revolution of the roller, and consequently the rotation of the roller can be checked at shorter intervals than it can with the other (the complainant's device), which, as I have before stated, necessitates a complete revolution of the roller and the unrolling of the curtain to that extent. In the Hartshorn device the pawl is attached to and constructed in form so as to coincide circumferentially with and ride over the surface of the stationary hub, the pivotal end of the pawl in this device being placed 195 near to the hub upon the disc, while in the defendants' device it is attached as near the perimeter of the disc as is possible and away from the hub, so that it will engage with the latter at any point in which one of the openings of the ratcheted hub will engage with the pawl; thus the roller can be rotated and checked at a quarter or half of a revolution, which cannot be done by the other (the Hartshorn) device as the hub is constructed and the pawl located. The defendants' device makes a nearer approach to the English Smith patent as regards the connection between the pawl and the ratcheted hub than it does to that showing the Hartshorn reissue 7370, with the exception that the defendants use a stationary hub and put the pawl upon the disc at the end of the roller instead of on the roller-cap of the English patent. The defendants' device and the complainant's device both use a pawl attached to the roller disc and a stationary hub; in this respect they resemble each other, but the pawl and hub of the defendants' device are constructed to engage in a different manner, as I have before stated.

Q. 28. Will you examine Complainant's Exhibit Saginaw Barrel Company's Roller, No. 2, and state, in view of the state of the art as appearing in the English Smith patent, English Davis patent, and the first Hartshorn patent of 1864, whether we make a device which is covered by the first claim of the Campbell reissue patent No. 7367, which is not shown in some of the patents above cited, and give your reasons for such opinion?

Ans. In my opinion the defendants' device does not contain the invention described in the reissue 7367, as named in the first claim of said reissue. As I have before stated on this examination, the said reissue 7367 shows a means of operating the torsion-196 spring of curtain-roller by means [of] pins working in holes, so as to engage with the flattened side of a shaft, D, and that these could not in any sense be reasonably interpreted to mean pawls; I do not find any such pin in the defendants' device and that one named in the question. It is true this reissue terms these pins pawls, but even if they are pawls they are not pivoted to the perimeter of the roller-disc and do not drop into the holes or notches formed in the hub from their pivoted connection and having a hooped end.

Q. 29. The same question is repeated as to the Jacob David patent.

Ans. As I have before stated on my examination, the David patent illustrates and describes a latch arranged upon a curtain-roller so as to move with it and to slip over or engage with slot formed in the bracket which receives the stationary end of the roller, so as to check or arrest the force of the spring in rolling up the curtain. This device of necessity makes the bracket a part of the fixture to operate it, and in this respect is widely different from defendants' device, the only function of the bracket in the latter being to receive and sustain in position the stationary part of the roller to which the torsional spring attaches. There is not any resemblance whatever between the means employed to regulate or arrest the torsional force of the spring, as shown in the David patent when it is compared with the defendants' device, with the exception that both serve as detents, that in the David patent being a latch and bracket catch and that in the defendants' a pivoted hooked pawl and a ratcheted hub.

Q. 30. I find in the first claim of this David patent the following: "The arm or detent K, arranged upon the roller in such a manner
that it moves towards and away from the center or axis of
197 the roller *a* by the action of gravity and centrifugal force."
Will you give your opinion as to the meaning of that claim?

Ans. I assume it to mean that when the roller is moved rapidly the latch K is thrown outward by the rapid motion of the roller so as not to engage with the latch formed in the bracket, but that when moved slowly gravity would cause it to drop into the bracket catch, but the language of the claim is rather ambiguous, *an* the fact that it states that it moves towards and away from centre or axis of the roller *a*, by the action of gravity and centrifugal force," from which one would infer that gravity or centrifugal force, either one of them, performed one or both offices of moving it towards or away; but I think as modified by the words, substantially as described, it would be as I have stated; as a fact, whether this is so or not, and the velocity at which the curtain can be moved is sufficient to throw out this latch by centrifugal force, I very much doubt. I have no doubt, however, that it does jump over the catch and move rapidly so as not to engage with it.

The defendants offer in evidence certified copies of the models in the United States Patent Office of the patent to William Campbell, No. 69176, dated September 24th, 1867; a model of Stewart Hartshorn patent, No. 68502, dated September 3, 1867; and of Jacob Davis, No. 69189, dated September 24, 1867; and of Stewart Hartshorn's patent, No. 44624, dated October 11, 1864.

Cross-examination by Mr. Law:

Q. 1. You have in your answers to the several Hartshorn, Camp-
bell, and David patents, in evidence in this cause, made par-
198 ticular and repeated reference to what you call a torsional
spring in those patents; do you regard a torsional spring as
an important element of the inventions described in those patents?

Ans. I do.

Q. 2. Is there in mechanism a kind of spring known as torsion or torsional spring?

Ans. There is a spring especially denominated as such.

Q. 3. What is understood in mechanism by a torsional spring, and what are its peculiar and distinguishing characteristics?

Ans. A torsion-spring is understood in mechanism to be one that resists a twisting motion, and is constructed for that purpose.

Q. 4. When in your answers as to the several patents of Hartshorn, Campbell, and David, originals and reissues, you use the words "torsional spring," or "utilizing a torsional spring," what do you mean to be understood?

Ans. I mean a spring that is twisted to store up force, which you untwist to release that force; and by the term "utilizing" I mean the mechanical means by which that force is stored up and by which it is made available for the purposes designed.

Q. 5. You do not mean, then, by the word torsional that the spring in those rollers is a torsion-spring, as that term is understood in mechanism?

Ans. I think it is torsional or volute, torsion being used in both.

Q. 6. Is a torsional and volute spring the same?

Ans. No, sir; only a volute spring is capable of performing a torsional action in the same manner that the springs I have denominated torsional springs do.

199 Q. 7. Are not the springs in the several patents in evidence—Hartshorn's original patent of 1864, No. 44634; its reissue, No. 2756; Hartshorn's original patent of 1867, No. 68502; its reissue, 7370; Campbell original patent of 1867, No. 69176; its reissue, 7367; the David patent, No. 69189; and in the Complainant's Exhibit Defendants' Roller, all of the same kind?

Ans. They are about the same.

Q. 8. Is there any difference in the springs used in those several rollers referred to in the last question?

Ans. I do not know that there is any material difference; I have not the springs; I have only the drawings for the springs, as shown in the patent named, to compare with the springs shown in the defendant's device, complainant's exhibit named in the question. The helical coils in the defendants' device are somewhat more peculiarly arranged than they are in the devices shown in the drawing, but in their operation I could say they were about the same.

Q. 9. Are not the springs shown in said patent and found in the defendants' roller what are known as spiral or coil springs?

Ans. They are, but they are arranged to operate by torsion entirely, and not by the ordinary direct resistance of spiral springs as commonly used, one end of the spiral spring being attached to the roller, the other end attached to the fixed bar inserted in the ratchet, so that when the roller is unrolled against the force of this spring the latter stores up a torsional force. Spiral springs, as they are usually termed, when called by that name, are arrranged to act by the direct resistance of the coil against it, and not by the twisting of the coil and its torsion.

200 Q. 10. In this fixture, when the roller is pulled down or unrolled, is the material of the spring twisted or the coil made more compact?

Ans. It is twisted, and in twisting it may be made more compact by shortening up its distance of length.

Q. 11. Is it what you call the twisting that gives force to the spring, or is it the compactness of the coil?

Ans. It is the twisting; the compactness of the material is produced by the twisting, and if the object was to move in and out something from the roller then the question of compactness would have something to do with its action; but, inasmuch as the compactness itself is not utilized as a force to move anything from out of the roller, which would be the ordinary use of a spiral spring, it is plain that the torsion of the spring as stored up and released is the only force employed.

Q. 12. Do you mean to say that the action of the springs in these rollers is the same as it would be if the spring instead of being coiled was a straight piece of metal fastened at one end to the roller, as it is now, and at the other end to a fixed part, so that when the roller was unrolled that piece of metal would be twisted itself?

Ans. Very much the same effect would be produced; the action would be the same, provided the thin blade could be inserted within the roller, attached at one end to the roller and at the other end to the bracket, and the roller twisted so as to twist the spring; then such a spring would be torsionally used as the spring in the roller named.

Q. 13 And do you mean that the springs used in those rollers are the same as would be a spring such as you have described in your last answer?

Ans. I do not so state; one would be the use of a straight
201 spring, arranged to produce a torsion, and the other would
be the use of a helical or spiral spring to produce a torsion; the effect of the two springs would be the same; both would act torsionally, and in that respect they would be alike.

Q. 14. And in both cases the effect is produced by the metal that composes the spring?

Ans. Yes, sir; in the one case it is produced by the twisting of the coils of metal and in the other by the twisting of the metal of which the straight blade is composed.

Q. 15. The effect is produced by the twisting alone?

Ans. Yes, sir; and by the elasticity of the material of which the spring is made.

Q. 16. In mechanics, do the words coil or spiral spring indicate and mean springs of the same kinds?

Ans. In their general sense they do not, but a spiral spring may be arranged to act for the same purpose.

Q. 17. If an intelligent mechanic was directed to make a torsion-spring would he make such a spring as is found in this patent and as found in defendant's roller?

Ans. I think common sense would suggest to him, if he was a good mechanic, that the best way to obtain torsion would be through a helical spring instead of through a blade spring, if applied to the interior of a roller.

Q. 18. Is that the best and most direct answer you can make to the question?

Ans. I may say this, I am not a mechanic and consequently must modify my answer in accordance with the best knowledge I have in regard to those matters.

Q. 19. You mean, perhaps, that if you were the intelligent mechanic you would do so?

Ans. No; I do not think my bump of self-conceit is above the average.

202 Q. 20. You say the hub in the Hartshorn patent 7370, which engages with the pawl, is "arbitrarily constructed with a notch upon the top;" what do you mean by the words arbitrarily constructed with a notch upon the top?

Ans. Because the notch is placed upon the top and the pawl is constructed to engage with a notch in the top, and as the pawl is constructed and the notch arranged it could not very well be used in any other way; that is what I mean by the term arbitrarily.

Q. 21. Then, in your opinion, as I understand you, the notch in that fixture must be on the top of the hub?

Ans. As shown and described in the patent, and as the pawl is constructed, it must be; no other form of notch being described in the invention or even hinted at, the inner side of pawl being coincidentally rounded out to pass around the stationary part of the shaft as so made, it would only operate as I have described.

Q. 22. In your answers as to the Hartshorn reissue 7367 and the David patent, do you use the word "torsional" in connection with the spring; do you use it in the same sense with respect to those patents that you did with respect to those patents of 1867?

Ans. Yes, sir; I would say that I did.

Q. 23. The stop-lever of the David patent, as you call it, is attached to the roller by a pivot so that it revolves with it, is it not?

Ans. Yes, sir.

Q. 24. Is not the last or free end of that lever kept from engagement with the slot or ratchet by centrifugal force?

Ans. I do not think that it would be; I think the ordinary motion with which the roller moves is not of that high velocity 203 calculated to throw off with any visible force the drop-lever to latch, which occurs in that device as attached to the roller; it gives it momentum, but not centrifugal force.

Q. 25. If it is not centrifugal force that prevents the engagement by throwing out the ratchet, what is it that prevents the engagement?

Ans. While the rollers move rapidly its momentum prevents the latch from dropping into the catch upon the ratchet, which I think it does, when moved with the ordinary velocity with which a roller can be moved; the momentum of an ordinary velocity is sufficient to carry it over the catch. I, however, do not think this velocity is sufficient to produce a centrifugal force enough to do it.

Q. 26. Then the first claim of the David patent, in your opinion, makes a misstatement as to facts?

Ans. Yes, sir; I think it does in stating the natural fact; I admit that the result of the catch-latch passing over the catch when the roller is moved moderately fast is accomplished, but I doubt whether the roller has velocity enough as used to produce such results by its centrifugal force; in that respect I think the claim does not state the natural facts occurring in the operation of the device.

Q. 27. But that stop-lever in the David patent engages with the slot on the bracket, does it not?

Ans. I think it does; I think gravity does cause it to fall, and when the device is moving slowly gravity has an opportunity of acting which it does not have when the device is moving more rapidly and has momentum enough to carry it over the catch.

Q. 28. In reference to the Hartshorn patent, reissue No. 2756, did you use the words torsional in the same sense there that you did in reference to the patent 7370?

Ans. I did.

204 Q. 29. Is it a necessary construction of the roller described in that patent, 2756, that the pawls should be, as you say, arranged to engage at the top of the roller with notches in the latter?

Ans. I think it would engage at the top with the notch, but the pawl not being fitted to surround the shaft, as shown in the other patent, it would not abitrarily be compelled to engage exactly at the top. The two notches (one at the top and one at the bottom) of the roller engage with either of these in passing at a half a revolution of the roller, and in that respect would differ from the Hartshorn reissue 7370, but still it would engage at or near the top when the notched side of the roller was uppermost. The inventor also provides or suggests (but does not show) a modification of that so that the pawl may be placed underneath and a spring combined with the pawl to enforce it to engage with the notches in another position; I am now speaking of the reissue 2756 of the patent dated October 11, 1864.

Q. 29. Then it is not a necessary construction of the roller described in that patent that the pawl should engage at the top of roller?

Ans. It is as shown in the drawing itself, but the inventor suggests *for the* modification not shown in the drawings, by which the roller may engage in another way.

Q. 30. In the English Smith patent what kind of a spring is used to revolve the roller?

Ans. A torsion spring, which the inventor states, and it is made of any material, and amongst many others rubber, metal cat-gut, etc.

Q. 31. This spring used in the English Smith patent operates in the way that torsional springs, as they are generally known, operate, does it not?

205 Ans. It operates to produce torsion—to produce by torsion a stored-up force; it is not one kind of torsional spring, as generally known to the art, although it is a spring arranged to produce torsion; there are other kinds which differ from it.

Q. 32. The spring found in the English Smith patent is not the same kind of spring that is found in the other patents I have referred to in the defendants' roller, is it?

Ans. In construction it is not; it is arranged to produce the same result by torsion.

(Last sentence objected to as irresponsive.)

Q. 33. Smith, in speaking of the modes or means of raising or lowering the roller or shade according to his improvement, says: "That one improvement consists in dispensing with the spring ordinarily used to press the pawl on the ratchet-teeth?"

[Ans.] ——.

Q. 34. In the patent does any figure show a pawl pressed on the ratchet by a spring, as described by him?

Ans. It does; figure 5A shows it.

Q. 35. In the Smith fixture, as described in his patent, what, if anything, is attached to the longer or outer arm of the pawl, the inner end of which he says he weights so as to dispense with the spring?

Ans. A trigger and a trigger-cord to operate the pawl, which he combines with the pawl.

Q. 36. Anything else besides the cord and trigger?

Ans. I believe he mentions a tassel on the cord. I would have mentioned it if I supposed it was important or asked for in the question.

Q. 37. Is not the cord and tassel which he describes as being attached to the outer end of the pawl heavier than the inner or short, weighted end of the pawl?

Ans. I think not.

206 Q. 38. What does this clause in the Smith patent mean: "When it is desired to cause the pawl to catch into the teeth of the ratchet it is only necessary to relieve it of part of the weight of the cord and tassel by holding it up by the hand."

Ans. My opinion is that means taking hold of the tassel upon the bottom of the curtain and raising the curtain a little; the purposes of the tassel shown and the trigger-cord being for an entirely different purpose—to relieve the pawl and roll up the curtain—therefore the handling of this tassel in the quotation named in the question would perform the result stated in the question, and the raising up of the other would not. I will, state, however, that no tassel-cord is shown attached to any curtain in the patent. I assume that to be the tassel meant, from the fact that the lifting up of the other tassel could not be employed for any such purpose; and I find that just such a result can be produced as stated in the quotation named, in the model of the Smith patent filed in this case; by lightening up the tassel at the bottom of the curtain the effect named is produced, and by lightening up the tassel-cord no result whatever is produced; so I assume the quotation to refer as I have stated.

(All of the answer of the witness referring to the model objected to by complainant's counsel on the ground that it is not called for by the question in any sense, as complainant's counsel understands it, and not suggested to the witness.)

Q. 39. In the specification of the English Smith patent is there any other way described of causing the pawl, the short or inner end of which has been weighted as described by him, to catch into the teeth of the ratchet except by relieving it (the pawl) of part of
207 the weight of the cord and tassel by holding it up by the hand?
And please confine your answer to what is described in the patent, and not to what you suppose should be there or what may be shown in the said model and said to represent the Smith fixture.

Ans. Assuming that the quotation in the question relates to the parts named, and their operation is as stated in the question, there is no other way; this, however, occurs in the patent, which may relate to the former quotation, "the moment, however, the click F is released the removable tendency which the torsion-spring has to return to its original position comes into full play and causes the roller to revolve in a contrary direction, and thereby raises the blind." This latter quotation of the patent does not limit the operation of moving the curtain necessarily to the quotation named in the question, and it may relate to a means of raising the curtain by lifting the tassel upon the bottom of it; I thus modify the first part of this answer on having re-examined the patent.

Q. 40. What is the part called click F in your last quotation?

Ans. It is an additional element combined with the pawl and connected by a cord and tassel, by means of which, without touching the curtain and pulling it down, the cord, instead of lightening it up, the pawl will be released and the curtain rolled up.

Q. 41. Is that additional element, which you refer to in your last answer, shown in the drawings of the Smith patent anywhere? And, if so, will you mark the part which you call the click upon any drawings that might be in that patent?

Ans. At figure 5 is a letter which may pass for an F or E, and I refer to the one immediately adjacent to the part which connects with the pawl; and this is not a fully developed E; the down-
208 ward fly stroke of the F across its horizontal center has been carried down to join the bottom line of E, which gives it the appearance of an E. The letter E is also shown in this drawing as placed upon the cap to which the pawl and trigger are attached, and corresponds with the cap in the other drawing, figure 4, A2.

Q. 42. Please mark with the letter Y the element you call the click or trigger which you say is combined with the pawl.

Ans. I now mark what I denominated the click or trigger, and I have so done.

Q. 43. The patent says in the quotation last given by you, "the moment, however, the click F is released" (which click you have marked Y), is released from what?

A. Released—that is to say, it and the pawl with which it connects is released from the ratchet.

Q. 44. Now, is not that part called the click the part of the pawl which catches into the teeth of the ratchet and holds the roller, and is not the meaning of the quotation you have given, which is, that when the click is released, it means elevated away from contact with the ratchet, so that the spring can revolve the roller, not winding up the curtain?

Ans. The use of the term pawl or click seems to be synonymous; where I have used the term trigger, on re-reading the patent, I find must relate to the long arm of the pawl or click, and that the operation as asked for is as stated in the question; this evidence being given with relation to figure 5A, and relates to thr modification of the patent, in which a spring is used to operate the pawl or click, and in which the operation is as stated.

209 Q. 45. Then the part of the patent you quoted this morning in your answer to question 39, "the moment, however," etc., does not have any reference to the operation of the pawl, the short or inner end of which has been weighted to dispense with the spring ordinarily used to press the pawl on the ratchet-wheel?

Ans. It does not.

Q. 46. In the figure 5A, in the Smith patent, the curved single line, one end of which presses on the top of the pawl near the pivot, and the other end of which is at the bottom of the circle indicating the roller, is intended to represent the spring, is it not?

Ans. I think it is.

Q. 47. And in the Smith fixture, when a pawl is used which has [a] spring to keep it in contact with the ratchet, as shown in figure 5A, it would be necessary in all cases that the roller was allowed to rotate to roll up the curtain to lift that pawl from out the ratchet against the force of that spring?

Ans. I think it would; yes, sir; and this would be done by pulling down the cord shown in figure 5A, hanging from the lever, and not by raising up on the cord.

Q. 48. In the Smith fixture, when the pawl used is not fitted with a spring which keeps it down into the ratchet-teeth, but is the pawl which he has described as having the short or inner end weight for the purposes of dispensing with the use of such spring, is there any way shown or described in the Smith patent for causing that weighted pawl to catch into the teeth of the ratchet, except by lifting the cord and tassel by the hand (or some way) to relieve the pawl from the weight of such cord and tassel?

Ans. No method is described, if you assume that the lifting of the cord and tassel to produce the effect stated refers to that device or that modification of the fixture alone.

210 Q. 49. You read in your answer to the 15th direct interrogatory about the Smith fixture, it appears "that when the curtain was moved rapidly the pawl would overrun the ratchet so as not to engage with it, but when moved slowly the pawl would drop into the ratchet-hub, engage with it, and so stop the revolution of the roller." Where in the Smith patent do you find any description, statement, or language to the effect of any such operation of that fixture?

Ans. I do not know that there is any specific language or any language describing such an effect. I inferred such to be the case from the construction of the device, and believe it will so operate.

Q. 50. Do you find any statement or intimation in the English Smith patent to the effect that the Smith fixture can be operated by handling the curtain alone?

Ans. I do not, further than I have already stated, except that which occurs in the paragraph which relates to that modification made without the spring, and which commences with the words "which consists;" and where it states when it is desired to cause the pawl to catch into the teeth of the ratchet it is only necessary to relieve it of part of the weight of the cord and tassel by holding it up by the hand. I think this may refer reasonably to a cord and tassel attached to the bottom of the curtain, although not shown in the patent, by which the curtain might be run up rapidly, so that the pawl would not engage with the roller, or slowly, so that it would drop into the ratchet and arrest the roller, or, as it says in the quotation, catch into the teeth of the ratchet. That is all there is occurring in the patent upon which I have based the opinion I have stated.

211 Q. 51. In your answer as to the English Smith patent you say: "I find also that in the English Smith patent that a pawl and ratchet were arranged in connection with a roller and roller-spring, so that the roller can be removed from the brackets without permitting the spring to unwind." What do you mean by that part of your answer, and where, in the Smith patent, do you find any such statement referring to such an operation?

Ans. There is no statement to that effect, but it is very plain to any mechanic who would examine the device that such would be the result of the construction, as shown in figure 4 of the drawings. There is no explanation about it to that effect.

Q. 52. Will you please tell us how that is shown in figure 4, as my view of figure 4 seems to differ from yours?

Ans. I have already answered the subject-matter of the question. Without being captious I will answer it again, as the counsel desires. All the parts are shown in the sectional view of figure 4, excepting the bracket by which the pawl and ratchet, one formed on the hub and the other attached to a box, which is secured to the movable part of the fixture, so that the roller contains the spring with an end plate which moves around against the face of the box, which is secured to the stationary bar *Da*, which fits into the bracket, so that the moment the roller is lifted out of the bracket the parts are removed without disturbing their engagement, and in that way the roller can be taken from the bracket without unrolling the curtain.

Q. 53. Is there any description in the English Smith patent of a bracket so constructed as to allow the roller to be lifted from it?

212 Ans. There is not. I assumed the general method of attaching to have been employed.

(The last clause of the answer objected to as not called for by the question, and as irresponsive.)

Q. 54. In the drawings attached to the Smith patent do you find any bracket shown of such a construction as to allow the roller to be lifted from it?

Ans. There is not. Brackets are shown, but not shown with open ends.

Q. 55. In the defendants' exhibit marked Model Smith's English Patent is the ratchet-wheel on that model of the same form as to its teeth and to the shape of the space between the several teeth as is the ratchet shown in the English Smith patent drawings?

Ans. They are, with the exception that the teeth are not cut quite so deeply into the hub. They are very much the same, with the difference that I have mentioned. They are separated, however, by a little more space than they are shown in the model and shown in the drawing, but of the same general form.

Q. 56. In that model is the pawl of the same shape and form as is the pawl shown in the patent?

Ans. I think it is. It is not an exact *fac simile* of it, but it differs very little from it.

Q. 57. In that model there is a tassel attached to the bottom of the curtain, and I understand you to have said that the Smith patent does not describe or show any such tassel?

Ans. The question is correct.

Q. 58. In that model there is at the bottom of the curtain a weighted bar. Is there any such thing in the Smith patent, already described?

Ans. I do not know that any curtain is shown in the Smith patent, and consequently there can be no bar of any kind at the bottom.

213 Q. 59. In that model one of the brackets is so constructed that the roller can be removed therefrom without disturbing the bracket. I believe you have stated that the patent does not show or describe any such bracket?

Ans. That is so.

Q. 60. In that model the end of a spindle that goes into the bracket, and which is held thereby from revolving, is flattened. What is the form of that end of the spindle as described in the Smith patent?

Ans. It terminates in a square piece; the patent states that it terminates in a square piece which fits into a corresponding aperture in the bracket G1, "neither the box nor spindle being intended in any case to revolve."

Q. 71. You have defined what a pawl is; can you give me any authorities sustaining your definition of a pawl?

Ans. I do not know that I can from memory.

Q. 62. You have stated also that a detent is not a pawl. Have you any authorities on that point?

Ans. I do not think that I have so stated, without modification. I have stated in connection with the use of a detent that where a pawl was used for a detent in one case and a pin was used for a detent in the other, that while both might be detents, that it did not necessarily follow that the pin was a pawl. If I have stated otherwise I made myself misunderstood by my language.

Q. 63. Will you tell us what is a detent, and the difference between a detent and a pawl?

Ans. A pawl may be used as a detent, and it is one way of making a detent, but it does not necessary follow that all detents are pawls because they act as detents.

Q. 64. What is a detent?

214 Ans. A detent is a device used to arrest the motion of a moving factor in a machine, in a general sense, as I assume the question to be asked.

Q. 65. Will you please, then, answer the question more definitely as to the difference between pawls and detents, as you understand them, distinguishing each?

Ans. I do not know how many different ways there may be of producing detents; I should think there might necessarily be a great many. Anything that would arrest the motion of a shaft would be a detent, or arrest a moving factor would be a detent; and if the interrogator will name some of the devices which may be used as such I can tell the difference between them and a pawl; I cannot give a specific answer to an indefinite question, and keep within the scope of the latter.

Q. 66. I have not asked whether such a thing used in such and such a place was or was not a detent, but I am endeavoring to obtain your opinion, you having defined what is a pawl, of what is a detent, by which two things can be distinguished generally from each other?

Ans. I do not know to what kind of detents the question refers, and am unable to compare a hypothetical thing with a real thing, particularly when the hypothetical thing is not named except in its function, for there are innumerable ways of producing detents.

Q. 67. Did I understand from your answer that a pawl may sometimes be a detent?

Ans. Yes, sir; it may be used as such.

Q. 68. And the words pawl and detent are frequently used synonymously, are they not?

Ans. They are, in connection with the same device.

Q. 69. Are not they ever under the general definition of this?

215 Ans. I think not; pawls are used for pushing devices sometimes or pulling them, and in such cases they do not act as detents; and other times as actuating motor factors, so that we cannot apply the term pawl to detent as synonymous terms, but where a pawl is used as a detent it may be called a pawl or detent very properly.

Q. 70. Did you construe the meaning of the word pawl, where it is used in the patent as meaning that specific structure which you have mentioned in defining the meaning of a pawl?

Ans. I did; that is to say that a pawl should be hinged so that its hook end would engage in the ratcheted opening or recess place, it to act as a detent, and be pivoted as to slide over the object when its operation as a detent is not required.

Q. 71. In your answer to question 14 you speak of the Campbell original patent and of the pins arranged so as to pass over to engage with the flattened side of the shaft D, so as to bind said shaft;

would the view that you took of the Campbell patent be modified or changed any by considering it constructed so that the pins engage with notches in the shaft instead of on the side of it?

Ans. Not at all.

Q. 72. You say in your answer 14 that the Campbell reissue has added to it something which did not occur in the original patent; I quote: "the interpolation or detent being a pawl and ratchet;" is there anything in the Campbell reissue which describes the construction of that pawl and ratchet which you say is something additional to that which is found in the original patent?

Ans. I find in the claim of the reissue that the pawl or detent and
the ratchet are named disjunctively, and so as to mean either
216 one or the other in such a sense, and consequently that the
word pawl, not occurring in the original patent, has been interpolated in the claim. As I have stated before, the word ratchet does [not] occur in the specification of the reissue and the word pawl I find to occur there, in which it is stated that the pins act as pawls or detents; where used in the specification and claim to which the specification relates it states as follows: "And it consists in the combination with a flattened or notched shaft or spindle of the roller, which acts as a ratchet, of loose or sliding pins or bolts acting as pawls or detents, and which, by their contact with such flattened or notched shaft or spindle, arrest and hold stationary the roller and its shade at any point desired." Such description occurs in the reissue in regard to the description of pawls, and which does not occur in the original, and which I denominated in my former testimony as an interpolation, the pins being named in connection as acting as pawls or detents.

(Answer objected to as irresponsive and question repeated.)

Ans. In answer to the question I repeat the former answer, and state that it is the best answer that I can make.

Q. 73. Is there described in the Campbell reissue any other or different mechanism than is described in the original patent; I do not ask whether the same parts are called by different names, but whether any different mechanism is described in the reissue from what is described in the original, waiving all question as to meaning of names; if there is, quote that part of the reissue describing such different mechanism?

Ans. There is not; the same mechanism is differently described in both patents, and this difference in description is what I meant
by an interpolation in connection with the claim.

217 Q. 74. You say the Campbell reissue includes an entirely
different method of operating the detents to check the motion
of the roller than is found in the original; what is that different method of operation, and give the language of the patent where it is described?

Ans. Well, it occurs in the use of the term pawl, disjunctively, with that of detent and rachet, occuring in the claim, and that while I have quoted from the specification before which did not occur in the original.

Q. 75. Does the operation of the engaging parts in the reissue, by whatever name called, produce any other or different result than was produced by the operation of the engaging parts of the original patent?

Ans. Confined to the drawings, they would not.

Q. 76. Taking the question as not confined to the drawings but to the patent and drawings and specification, is there any different effect produced by the operation of the parts described in the reissue from that produced by the parts described in the original?

Ans. So far as the results produced by the operation of the device is concerned, I think it would be the same.

Q. 77. Is or is not the claim in the Hartshorn reissue 7370 a claim for a specific construction and arrangement of the parts for a specified purpose?

Ans. I think it is; yes, sir.

Q. 78. Is there shown or described in the original patent or its reissue the same construction and arrangement of parts which are claimed in the Hartshorn reissue 7370?

Ans. Not unless you consider the claim in the former—the Campbell patent—to include pawls as well as pins; if you do, then the original Campbell patent would embody what is shown in the Hartshorn reissue named in the question; I form my opinion
218 from a disclaimer occuring in the Hartshorn patent, that the Campbell patent of September 24, 1867, was the older patent, as I have before termed it, from the fact that Hartshorn so states it to be in his specification, in his disclaimer preceding the claim, and I have so considered it in making this answer, and if the pins shown in the Campbell patent mean pawls, and the Campbell patent is the older one, as stated by Hartshorn in his reissue, then the Campbell would anticipate the other, as I have stated, and be for the same invention.

Redirect examination:

Q. 79. In your cross-examination you was examined in regard to the cord and tassel shown in the Smith patent; will you look at that patent again and state what the object of that cord is which is attached to the trigger or click shown in figure 1?

Ans. I think it may be used to pull down the trigger and raise the pawl to roll up the curtain rapidly; it may also be used to lift the pawl if desired to raise up the curtain with the force of the spring; it is only a method of using a combined pawl and trigger.

Q. 80. What would be the effect if the cord and tassel were heavier than the weighed inner end of the pawl?

Ans. The ratchet would not engage at all.

Q. 81. Will you look at the original Campbell patent and at the defendant's device, Complainants' Exhibit Saginaw Barrel Company's Roller, and state if that device infringes the claim of the original Campbell patent?

(Objected to, as the original Campbel patent is not in suit and is not in existence.)

219 Ans. It does not, in my opinion, and for the reasons I have given in regard to the construction of the Campbell patent named in the question.

Q. 82. Will you examine the various patents in suit here, and state whether they all contain weighted pawls or not, or pawls acting by gravity to engage?

Ans. They are all weighted at the point of engagement, with the exception *that* the David fixture, in which the latch is not weighted at its drop end, but is rather smaller than its pivoted end, but which acts by gravity when it falls to engage with the bracket.

Recross-examination:

Q. 83. In the defendants' roller is not the pawl kept away from engagement with the notched ratchet by centrifugal force?

Ans. I think not.

Q. 84. What keeps it away then; is there any mechanical device whatever to keep it away from engagement?

Ans. There is no mechanical device; but I do not think the motion of a curtain-roller as used, and made to be used, would develop sufficient centrifugal force to throw out the pawl away from the hub; I think it does not engage with the latter from the fact that when rapidly moved over the end of the pawl bounces over from one face of the hub to the other and clears the opening.

Q. 85. I suppose from your last answer and from your answer in regard to the David fixture heretofore given that it would follow that the pawl shown in the Hartshorn reissue 7370 is not kept away from engagement with the notched hub by means of centrifugal force, would it not?

220 Ans. I think it is not kept away by centrifugal force, as I have before stated.

Q. 86. The pawls in all three of those patents work alike?

Ans. Yes, so far as being thrown down by gravity, they do; and, so far as being moved rapidly, they pass over the holes, but do not engage with them.

Q. 87. Do the pawls in the Hartshorn reissue 7370, in the David patent, and in the defendants' roller all operate in the same way in respect to being kept out of engagement?

A. I think they do, from the same natural cause.

State of Michigan,
Eastern District of Michigan, County of Wayne:

On the 28th day of June, 1882, personally appeared before me, a notary public in and for the county of Wayne, in the eastern district of Michigan, William E. Hagan, the witness who signed the foregoing deposition, and was by me sworn to tell the truth, the whole truth, and nothing but the truth, in the hereinbefore-entitled cause. Said deposition was taken by a stenographer, who afterwards wrote out the same upon a typewriter.

H. S. SPRAGUE,
Notary Public, Wayne County, Michigan.

221 Circuit Court of the United States, Eastern District of Michigan.

STEWART HARTSHORN, Complainant and Appellant,
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, and REUBEN KIMBALL, Defendants and Appellees.

Received from Stewart Hartshorn, the above-named complainant and appellant, two hundred and fifty dollars in cash, said amount being deposited under an order of the U. S. circuit court for the eastern district of Michigan, bearing date the 25th day of June, 1883, and to be held by the undersigned, as clerk of this court, subject to the further order of this court.

WALTER S. HARSHA, *Clerk.*

Due service of a triplicate receipt, the same as the above, is hereby admitted, dated ——, 1883.

—— ——,
Defendants' Solicitors.

Endorsed: 2778. U. S. circuit court, east. dist. of Michigan. Stewart Hartshorn *vs.* the Saginaw Barrel Co., A. W. Wright, A. A. Brockway, and Reuben Kimball. Receipt of deposit on appeal filed June 25, 1833. Walter S. Harsha, clerk.

222 STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, and REUBEN KIMBALL.

To the honorable the Supreme Court of the United States:

The appeal of Stewart Hartshorn, the above-named complainant, respectfully showeth:

That on or about the eleventh day of November, 1881, said Stewart Hartshorn, complainant, filed his bill of complaint in this suit in the circuit court of the United States, for the sixth circuit, in the eastern district of Michigan, against the said Saginaw Barrel Company, A. W. Wright, A. A. Brockway, and Reuben Kimball, defendants, alleging the infringement by said defendants of certain letters patent for improvement in shade or curtain fixtures which had been issued to and were owned by the above-named complainant, to wit: Letters patent No. 69189, dated September 24, 1867, and reissued letters patent Nos. 7367 and 7370, both dated October 31, 1876, and praying for an injunction against the said defendants, their agents, attorneys, servants, and workmen, and each and every of them, from making, constructing, using, or vending shade or curtain fixtures made in accordance with or containing or employing and using the invention or improvement described in said letters patent.

And that said defendant should account for and pay over to the said complainants the profits acquired by them, said defendants, from making, constructing, using, or selling shade or curtain fixtures constructed according to or employing and using the invention or improvement described in said letters patent.

That said defendants filed their answer to said bill of complaint, to which answer the usual replication was filed by the said complainant.

That testimony was taken in said cause on the part of the complainant and defendants therein, and that such proceedings were had therein that said cause came on for final hearing on the 9th day of April, 1883.

And that on the 10th day of April, 1883, a decree was made and entered therein by the said circuit court in the following words:

"At a session of the circuit court of the United States, for the eastern district of Michigan, continued and held pursuant to adjournment at the district court-room in the city of Detroit, on Tuesday, the tenth day of April, in the year one thousand — and eighty-three.

Present: The Honorable John Baxter, circuit judge, and the Honorable Henry B. Brown, district judge.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. D. BROCKWAY, and REUBEN KIMBALL.
} In Equity.

The above cause having been brought on to a hearing upon the pleadings and proofs, and after hearing S. D. Law, Esq., of 223 counsel for the complainant, and Charles J. Hunt, Esq., of counsel for the defendants, and after due consideration thereof by the court, it is hereby ordered, adjudged, and decreed that the bill of complaint in the said cause be, and the same is hereby, dismissed, with costs to the defendants to be taxed.

Judge Brown did not sit in this cause.

Which said decree of the said circuit court is, as this appellant is advised, erroneous and ought to be reversed.

That under said decree proceedings were had by the court as therein provided for, and that on the eighteenth day of May, 1883, a decree was made and rendered as to the costs taxed to the defendants in the following words:

At a session of the circuit court of the United States for the eastern district of Michigan, continued and held pursuant to adjournment at the district court-room in the city of Detroit on Friday, the eighteenth day of May, in the year one thousand eight hundred and eighty-three.

Present: The Honorable Henry B. Brown, district judge.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, and REUBEN KIMBALL.
} In Equity.

The above cause coming on to be heard in pursuance of the order heretofore made therein on the 10th day of April, 1883, and the costs to the defendants having been taxed at the sum of one hundred and eighty-five dollars and eighty cents, it is ordered, adjudged, and decreed that the defendants do recover of the complainant the sum of one hundred and eighty-five dollars and eight cents as costs in the above-entitled suit; which said decree of the said circuit court is, as this appellant is advised, erroneous and ought to be reversed.

Wherefore this appellant appeals from the whole and every part of each and every of the said decrees of the said circuit court, to the Supreme Court of the United States, and respectfully prays that the said decrees of the said court and the complaint, answer, pleadings, depositions, evidence, and proceedings in the said cause may be sent to the Supreme Court of the United States, and that the said Supreme Court will proceed to hear the said cause anew, and that the said decrees of the circuit court and every part thereof may be reversed, and a decree made in favor of this appellant for his damages and costs, or such other decree as to the said Supreme Court shall seem just.

Dated June 18th, 1883.

STEWART HARTSHORN.
S. D. & J. T. LAW,
Compl't's Sol'rs.

Endorsed: 2778. Stewart Hartshorn *vs.* The Saginaw Barrel Co., A. W. Wright, A. D. Brockway, and Reuben Kimball. Appeal to the Supreme Court. Filed June 25, 1883. Walter S. Harsha, clerk.

224 Circuit Court of the United States, Eastern District of Michigan.

STEWART HARTSHORN, Complainant & Appellant,
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, and REUBEN KIMBALL, Defendants & Appellees.

Whereas the complainant herein is about to appeal to the Supreme Court of the United States from the decrees herein entered on the 10th day of April, 1883, and on the 18th day of May, 1883:

Now, therefore, it is hereby stipulated and agreed by the respective parties to this suit that the complainant and appellant above named may deposit with the clerk of this court, in cash, the sum of two hundred and fifty dollars as security that said complainant will prosecute his appeal to effect, and will pay all costs and damages which may be awarded against him on said appeal, and that such money shall remain on deposit with said clerk under this stipulation, and the order be entered thereon, subject to the further order of this court herein.

And it is further stipulated and agreed that such deposit—to be evidenced by the service on defendants' solicitors and by filing in the office of the clerk of this court of a certificate of the said clerk that such deposit is held by him subject to the order of this court in this suit—shall stay the issuing of any process to enforce the levy and collection of the amount awarded to the defendants by the said decree of May 18th, 1883, as aforesaid, in the same manner and with the same effect as if a supersedeas bond in the usual manner and form as required by law to stay the issuing of such process were duly executed by said complainant and accepted and approved by the judge of this court.

And it is further stipulated and agreed that in case of the affirmance of the said decrees so appealed from, either in whole or in part, if the said complainant shall not, within thirty days after written notice to his solicitors of the entry of judgment of such affirmance, pay all costs and damages which may have been awarded against him in said appeal, and the amount awarded to the defendants by said decree of May 18th, 1883, or the part thereof as to which said decrees, or either of them, shall have been affirmed, then the said defendants may obtain from this court, on ten days' notice to the complainant or his solicitors, an order directing the said clerk to pay to the defendants all such costs and damages which may have been awarded against said complainant on said appeal, and the amount awarded to them by said decree of May 18th, 1883, if affirmed, and the overplus, if any, to the complainant.

It is further stipulated and agreed that upon the aforesaid payment of such costs and damages as aforesaid, and of such amount so awarded to said defendants by said decree of May 18th, 1883, if affirmed, or in case the said decrees shall be reversed, vacated, 225 or annulled, the said complainant may obtain from this court, on ten days' notice to the defendants or their solicitors, an order of this court directing the said clerk to pay or turn over to him, said complainant, such money so to be deposited as aforesaid, less any lawful charges and commissions touching the same.

Dated June 14th, 1883.

S. D. & J. T. LAW,
Solicitors for Complainant and Appellant.
SPRAGUE & HUNT,
Solicitors for Defendants and Appellees.

Endorsed: 2778. U. S. circuit court, east dist. of Michigan. Stewart Hartshorn *vs.* The Saginaw Barrel Co., A. W. Wright, A. D. Brockway, and Reuben Kimball. Stipulation as to deposit on appeal. Filed June 25, 1883. Walter S. Harsha, clerk.

226 At a term of the circuit court of the United States for the eastern district of Michigan, in the sixth circuit, held in the United States court-room in the city of Detroit, on the 25th day of June, 1883.

Present: Hon. Henry B. Brown, district judge.

STEWART HARTSHORN, Complainant & Appellant,
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY, and REUBEN KIMBALL, Defendants & Appellees.

On reading and filing the stipulation in the above-entitled cause, signed by the solicitors for the respective parties, dated June 25, 1883, and upon signing the petition of appeal and of the citation herein, on motion of S. D. Law, of counsel for the complainant, it is ordered and decreed that the complainant and appellant may deposit with the clerk of this court the sum of two hundred and fifty dollars in cash, as security that said complainant will prosecute his said appeal to effect, and will pay all costs and damages which may be awarded against him on said appeal, and that such sum shall remain on deposit with said clerk, under said stipulation and this order, subject to the further order of this court herein.

And it is further ordered that such deposit—to be evidenced by the service on defendants' solicitors and by the filing in the office of the clerk of this court a certificate of the said clerk that such deposit has been made and is held by him subject to the order of this court in this suit—shall stay the issuing of any process to enforce the levy and collection of the amount awarded to the defendants by the decree of May 18th, 1883, in this cause, with the like effect as if a supersedeas bond in the usual manner and form as required by law to stay the issuing of such process were duly executed by said complainant and accepted and approved by the judge of this court.

And it is further ordered that in case of the affirmance of the said decrees so appealed from, either in whole or in part, if the said complainant shall not, within twenty days after written notice to his solicitors of the entry of judgment of such affirmance, pay all costs and damages which may have been awarded against him in such appeal, and the amount awarded to the defendants by said decree of May 18th, 1883, or the part thereof to which said decrees shall have been affirmed, then the said defendants may obtain from this court, on ten days' notice to the complainant or his solicitors, an order directing the said clerk to pay to the defendants all such costs and damages which may have been awarded against said complainant on said appeal, and the amount awarded to them by said decree of May 18th, 1883, if affirmed, and the overplus, if any, to the complainant.

227 And it is further ordered that upon the payment of such costs and damages, as aforesaid, and of such amount so decreed to said defendants by said decree of May 18th, 1883, if affirmed, or, in case the said decrees shall be reversed, vacated, or annulled, the said complainant may obtain from this court, on ten days' notice to the defendants or their solicitors, an order directing the said clerk to pay or turn over to him, said complainant, such money so deposited as aforesaid, less any lawful charges or commissions touching the same.

Endorsed: 2778. U. S. circuit court, east. dist. of Michigan. Stewart Hartshorn *vs.* The Saginaw Barrel Co., A. W. Wright, A. A. Brockway, and Reuben Kimball. Order as to deposit on appeal. Filed in clerk's office June 25, 1883. Walter S. Harsha, clerk.

228 U. States Circuit Court, East. Dist. Michigan.

STEWART HARTSHORN
vs.
THE SAGINAW BARREL COMPANY, E. W. WRIGHT, and Others.

It is hereby consented that of the record in the suit of "The Salem Shade Roller Manufacturing Company *vs.* William G. Harris," heard in the U. States circuit court for the district of Massachusetts in the year 1875, and was put in evidence in the above-entitled cause on the part of the complainant herein and marked "Complainant's Exhibit Harris Record," there shall be copied and sent to the Supreme Court, on appeal, only the following portions:

Bill of complaint, pages 1 to 3, inc.
Answer, pages 3 to 9, inc.
Answer, amendments to, pages 96 & 97.
Replication, page 10.
Deposition of Wm. Campbell, pages 34 to 39.
Dated June 22, 1883.

S. D. & J. T. LAW,
Sol'rs for Complainant.
SPRAGUE & HUNT,
Sol'rs for Defendants.

Endorsed: 2778. U. S. circuit court, east. dist. of Michigan. In equity. Stewart Hartshorn *vs.* The Saginaw Barrel Co., A.W. Wright, A. A. Brockway, & Reuben Kimball. Stipulation as to record, Harris suit. Filed June 25, 1883. Walter S. Harsha, clerk.

229 A.

UNITED STATES PATENT OFFICE.

STEWART HARTSHORN, of New York, N. Y.

Improvement in Shade-fixtures.

Specification forming part of Letters Patent No. 44624, dated October 11, 1864; reissue No. 2756, dated August 27, 1867.

To all whom it may concern:

Be it known that I, S. Hartshorn, of the city, county, and State of New York, have invented a new and improved shade-fixture; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a front view of my invention applied to a window-shade; Fig. 2, a transverse section of the same taken in the line *x x*, Fig. 1; Fig. 3, an enlarged view of Fig. 2, showing a different position of the pawl; Fig. 4, a longitudinal central section of a portion of the shade-roller; Fig. 5, an enlarged detached front view of the bracket and pawl pertaining to the invention.

Similar letters of reference indicate like parts.

This invention relates to an improvement in that class of shade-fixtures in which the shade-roller is provided with a spiral spring for the purpose of automatically winding up the shade.

The invention consists in the application of a pawl and ratchet or notched hub, arranged in such a manner that the shade may be stopped and retained at any desired height or point within the scope of its movement by a simple manipulation of the shade, as hereinafter fully shown and described, the usual cord for operating or turning the shade-roller being dispensed with entirely, as well as counterpoises, which have in some instances been employed in connection with spring-rollers for holding the shade at any desired point.

A represents a window-shade, and B its roller, the latter having a spiral spring, C, fitted within it, and arranged in such a manner that it will have a tendency to turn the roller B and wind up the shade. The spring C is shown in Fig. 4. This feature, however, of a spring within a shade-roller for the purpose of winding or rolling up the shade is not new. To one of the brackets D, in which tho shade-roller B is hung, there is attached by a pivot, *a*, a pawl, E, said pivot passing through one end of the pawl, so that its opposite end will have a tendency to drop, by its own gravity, on a hub, F, attached concentrically to a plate, G, which is secured to one end of the roller B. (See Figs. 2 and 3.) The pawl E is provided with a projection, *b*, which, when the pawl drops, engages with either of two notches, *c c*, in the hub F, and holds the roller B, preventing the shade from being wound upon it. The projection *b* is made rather oblique or inclined at one side, *d*, so as to admit of being forced out of a notch, *c*, when the shade is pulled down. The other side, *d′*, of the projection *b* is made at right angles with the bottom of the pawl, so as to catch firmly against the front edges of the notches, and prevent the spring C from forcing the projection *b* out therefrom, and winding up the shade. By pulling down the shade, however, so that the projection *b* of the pawl will be forced out of the notch *c*, it is fitted in, and then allowing the spring C to turn the roller B briskly back, the projection *b* will slip over the notches, or the latter pass under the former, without catching, and the shade may be wound up to the desired height by the spring, the projection *b* of pawl E catching into a notch as soon as the motion of the roller is checked.

I would remark that, if desired, the pawl E may be placed underneath or at one side of the hub F, instead of over it, as represented, and a spring be made to bear against it in order that its projection *b* may engage with the notches *c c*. I prefer, however, the former method.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The application to a shade-roller, provided with a spiral spring for automatically raising or rolling up the shade, of a pawl and a ratchet, or notched hub, so arranged that former will engage with the latter at any point or height of the shade by simply checking the rotation of the roller and the upward movement of the shade under the influence of the spring, substantially as set forth.

STEWART HARTSHORN.

Witnesses:
ALEX. F. ROBERTS,
J. M. COVINGTON.

(Here follow diagrams marked pp. 230–231.)

232 UNITED STATES PATENT OFFICE.

STEWART HARTSHORN, of New York, N. Y.

Improvement in Curtain-fixtures.

Specification forming part of letters patent No. 68502, dated September 3, 1867; reissue No. 5558, dated September 2, 1873; reissue No. 7370, dated October 31, 1876; application filed May 27, 1875.

To all whom it may concern:

Be it known that I, Stewart Hartshorn, of the city, county, and State of New York, have invented a new and improved shade-fixture, and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and useful improvement in that class of shade-fixtures in which the shade-roller is provided with a spiral spring for automatically winding up the shade.

The present invention is an improvement on a shade-fixture of this class for which letters patent were granted to me, bearing date October 11, 1864, and reissued August 27, 1867, in which the pawl and ratchet or notched hub designed and used to arrest the rotation of and hold the roller were arranged to act automatically and in such a manner that the shade could be stopped and retained at any desired position or point within the scope of its movement by simply manipulating the shade and varying the speed of the rotation of the roller, and thereby dispensing with the use of side cords or counterpoises. As described and illustrated in such patent, the notched hub was attached to or made a part of the roller, while the pawl was fixed to one of the brackets which supported the rollers. In such arrangement, also, of these parts, when the roller is removed from its brackets, the pawl and notched hub are disconnected and the spring unwinds, which has again to be wound up previous to replacing the roller in its bearings.

In the present invention the pawl is hinged or pivoted as in the said patent referred to; but such pawl is placed on the end of the roller, or a part fixed thereto, and revolves with it, and the notched hub or rachet is placed upon the spindle or stationary part of the fixture. Such arrangement of parts also permits the roller to be taken from its brackets without the spring unwinding.

In the accompanying sheet of drawings, figure 1 is a longitudinal

S. Hartshorn,

Shade Fixture,

No. 2,756, Reissued Aug. 27, 1867.

Fig. 1

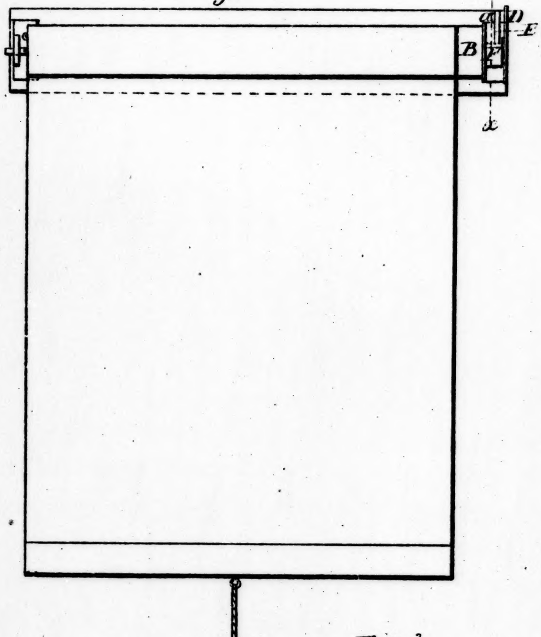
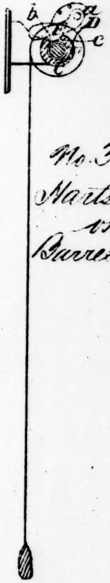


Fig. 2



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6.2

Fig. 3

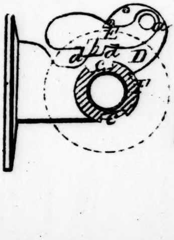


Fig. 4

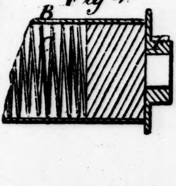
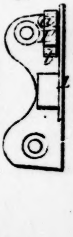


Fig. 5



Witnesses;
M. M. Lincoln
C. L. Topliff

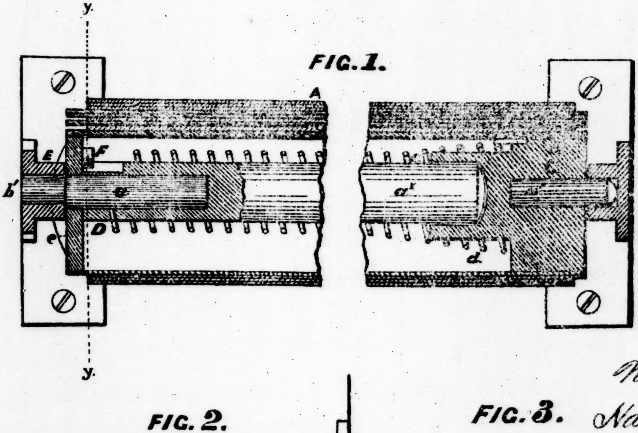
Inventor
Stewart Hartshorn

S. HARTSHORN.

CURTAIN-FIXTURES.

No. 7,370. **Reissued Oct. 31, 1876.**

FIG. 1.



No. 310.
Hartshorn
vs.
Barrel Co. et al.
p. 231.

FIG. 2.

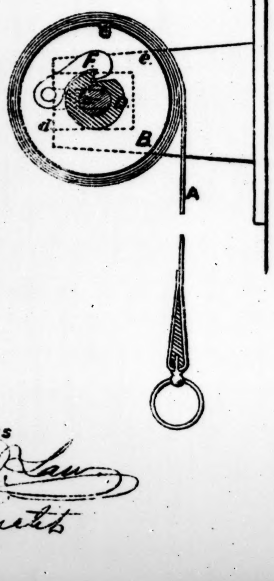
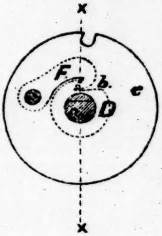


FIG. 3.



WITNESSES

S. D. Law

INVENTOR

Stewart Hartshorn

central section of a roller employing my invention, taken in the line *x x*, Fig. 2; Fig. 2, a transverse section of the same, taken in the line *y y*, Fig. 1; and Fig. 3 is an end view of such roller, showing the flattened end of the spindle, and, in dotted lines, the position of the pawl and notched hub.

Similar letters of reference indicate corresponding parts.

A represents a window-shade and B the roller to which it is attached, the roller having a spiral or other spring, C, fitted within it, and arranged in such a manner that it will have, when not restrained, a tendency to roll up the shade. The spring attachment, as represented, is the same as shown and described in my original letters patent. The roller B is provided with journals *a a′*, to one of which, *a*, sometimes called a "spindle," a hub, D, is keyed, said hub having a notch, *b*, made in it, as shown clearly in Fig. 2. The journal or spindle *a* of the roller is square, or has two flat sides at its outer end, as shown by dotted lines in Fig. 2, to fit into a bracket, E, attached to the window-frame, and this journal *a* does not turn with the journal; but the other journal, *a′*, is fitted firmly in a head, *c*, in the roller, and turns with it, and to such head the case of the roller (a metallic tube, *d*) is attached, the journal or spindle *a*, or an extension, a^x, thereof, being fitted loosely in the head *c*, so that the roller may turn without the journal *a*, as will be fully understood by referring to Fig. 1. The end of the case or tube *d* of the roller has a disk, *e*, Figs. 2 and 3, secured in it, and this disk, as the roller B rotates, turns with it, and loosely on the fixed journal *a*. This disk *e* has a pawl or detent, F, attached so its inner side, as shown more particularly in Figs. 2 and 3, and such pawl or detent, when engaged with the notch *b* in hub D, retains or holds the roller B, so that it cannot turn under the influence of the spring C and roll up the shade A. Such pawl or detent F is pivoted or hinged to the disk *e*, and acts substantially at right angles to the notched hub or spindle *a b*. The spring, when fitted in the case *d*, is attached at one end to the head *c*, and by the other end to the fixed journal or spindle *a*, or to its extension a^x, and the spring is wound up by pulling down the
shade B; consequently, when the shade is fully down the
233 spring will have a tendency to wind it up. The pawl or detent F engages itself with, and disengages itself from, the notched hub D automatically.

In the construction shown in the drawing, in order to insure the pawl engaging with the hub, the motion of the shade is simply checked, for, by having the roller A and its disk *e* rotate slowly, the pawl will drop into the notch *b*; but when such roller and disk are allowed to rotate rather quickly the pawl or detent will not drop into such notch, as its loose end will be carried, by the revolution of the roller, toward the periphery, or away from the notched hub; but, by changing or checking the revolution of the roller, the pawl will at once automatically drop into the notch and arrest the roller and shade. Hence the shade may be retained at any desired height without any difficulty whatever, as in the roller described in the previous patent, by merely varying or changing, through the simple manipulation of the shade, the speed of the rotation of the roller and the consequent movement of the shade.

The pawl or detent F is a hinged or pivoted pawl, as distinguished from a loose pawl moving in a chamber or guide of some form to keep it in position.

I do not claim, generally, the arrangement of both the pawl and ratchet upon or in connection with the roller, so that the roller can be removed from its brackets without permitting the spring to unwind, as I believe such an arrangement of pawl or detent and ratchet, as shown in the patent of William Campbell, granted to him September 24, 1867, had been known previous to being made by myself.

What is claimed as new is—

In a spring shade-roller having a pawl or detent and ratchet, or their equivalent, constructed and arranged so as to engage automatically for holding the shade at any desired point or height, the combination, with a ratchet, or its equivalent, upon the stationary spindle or stationary part of the fixture, of a hinged or pivoted pawl, placed upon the end of the roller, and acting substantially at right angles to the ratchet or notched hub.

STEWART HARTSHORN.

Witnesses:
S. D. LAW.
A. S. GURLITZ.

(Here follows diagram marked p. 234.)

235 UNITED STATES PATENT OFFICE.

WILLIAM CAMPBELL, of New York, N. Y., assignor to Stewart Hartshorn, of same place.

Improvement in Curtain-fixtures.

Specification forming part of letters patent No. 69176, dated September 24, 1867; reissue No. 7367, dated October 31, 1876; application filed May 27, 1875.

To all whom it may concern:

Be it known that I, William Campbell, of the city, county, and State of New York, have invented a new and useful improvement in window-shade fixtures; and I do hereby declare that the following is a full, clear, and concise description of the same, reference being had to the accompanying drawings, making a part of this specification.

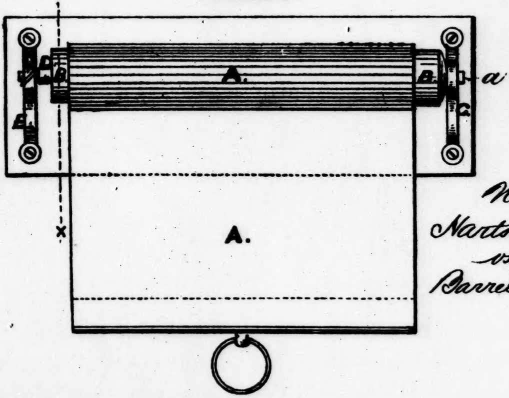
This invention is an improvement in that class of shade-fixtures in which the shade-roller is provided with a spiral spring for the purpose of automatically winding up the shade; and relates to an improved device or arrangement of parts by means of which such spring-roller, and the shade attached thereto, may be arrested and held stationary at any desired point or elevation within the range of its movement, and at the same time allow the shade to be drawn down

W. CAMPBELL.

CURTAIN-FIXTURES.

No. 7,367. **Reissued Oct. 31, 1876.**

FIG. 1.



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Hartshorne
vs.
Barrel Co. et al.
p 234.

FIG. 2.

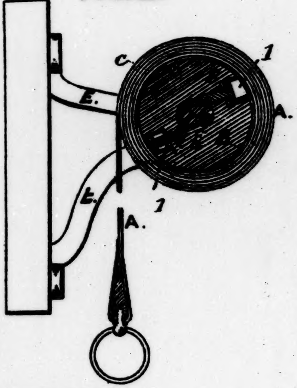
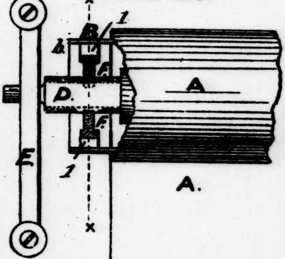


FIG. 3.



WITNESSES

L. D. Law
Hugh Jones

INVENTOR

William Campbell

or run up as far as may be desired without obstruction or stoppage, and by means of which also the tension of the spring will be preserved, or the spring be prevented from uncoiling when the roller is removed from the brackets, the same as when resting therein.

In such fixtures, as generally heretofore constructed, when the shade-roller is removed from the brackets the spring in the roller unwinds, which renders it necessary to again wind up such spring before placing the roller in its brackets, and this it is not easy for an ordinary or unskilled person to do; and it consists in the combination, with a flattened or notched shaft or spindle of the roller, which acts as a ratchet, of loose or sliding pins or bolts acting as pawls or detents, and which, by their contact with such flattened or notched shaft or spindle, arrest and hold stationary the roller and its shade at any point desired, and in arranging such pins or detents on the roller having such a flattened or notched spindle, so that there will be no disconnection of the detent and rachet when the roller is removed from its brackets, which prevents the spring unwinding.

Figure 1 is a front view of a roller, with shade attached, containing my improvement. Fig. 2 is a detail sectional view, enlarged, of the same, through the line *x x*, Fig. 1. Fig. 3 is an enlarged view of one end of Fig. 1, a part being broken away to show the position of the operative parts.

A is the window-shade. B is the hollow roller, in one end of which is fixed a pivot or spindle, *a*, turning with the roller, and which rests and turns in the bracket C, and the other end of such roller revolves upon the shaft or spindle D, the projecting end of which does not turn with the roller, but is held or secured in the jaws of the bracket E. One end of the spiral spring, within the roller B, is secured to the spindle D, and the other end to the roller B, so that, as the shade A is drawn down and the roller revolved, the spring will be wound up or closer around the shaft D, and thus have, when not restrained, a tendency to roll up the shade.

In the block or cap part *b*, that forms the end of the roller B, and forms its bearing upon the shaft or spindle D, and about which it revolves, are two holes or cavities, 1 1, upon opposite sides, extending from its outer surface to the shaft or spindle D, as shown in Fig. 2, the outer ends of which cavities may be countersunk, as shown.

The opposite sides of the shaft or spindle D, within the block or cap part *b* of the roller, are flattened or notched, as shown in Fig. 2, to take the pins or bolts moving in the cavities 1. F F are two pins or bolts or detents, the bodies of which fit loosely in the holes 1 1 in the block or cap *b*, and the heads of which fit loosely in the countersunk parts of such holes, the length of such bolts or detents being such that, when their heads are against the case or shell *c* of the roller, their points or lower ends will be free from or not be in contact with the shaft or spindle D; but when such bolts drop, so that their heads rest upon the bottom of the countersunk part of such holes, their points or lower ends will be in contact with the flattened or notched sides of the spindle or shaft D, so as to bind against such spindle and prevent the revolution of the roller. Whenever the shade A is drawn down, or is allowed to run up with a quick move-

ment, the centrifugal force, produced by the revolution of the roller
B, projects the pins outward, so that they are carried away
236 from the spindle D, and against the case or shell *c* of the roller,
thus permitting the roller to revolve freely upon the shaft or
spindle D; but when the shade and the revolution of the roller is checked, the bolt or detent F, which happens to be uppermost, drops down upon and against the flattened or notched side of the spindle D, and arrests the further revolution of the roller and holds it securely in place.

As these pins or detents are placed in a recess upon the roller, of which the spindle which forms the ratchet is also a part, they are equally effective to hold the roller from turning, whether the roller remains in or is removed from the brackets, and therefore the spring is prevented unwinding when the roller is taken out of its brackets.

The pins or detents F F are loose or sliding, as contradistinguished from such as are hinged or pivoted, and are kept in position so as to engage with the ratchet or notched spindle by the chamber or guide in which they move.

What is claimed as new is—

1. In a spring shade-roller having a pawl or detent and a ratchet, or their equivalent, so arranged as to allow the shade to be drawn down or run up without obstruction, and which engage automatically with each other to hold the shade in any desired position, the arrangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that when the roller is removed from its brackets the tension of the spring will be preserved.

2. In a spring shade-roller having a detent and ratchet, or their equivalent, constructed and arranged to engage automatically with each other for holding the shade, the combination, with the ratchet, or its equivalent, of a loose pawl or detent moving in a chamber or guide, and adapted to engage with the spindle.

3. The combination of the loose or sliding pins or detents F, constructed as described, with the flattened or notched shaft or spindle, substantially as herein shown and described.

WILLIAM CAMPBELL.

Witnesses:
S. D. LAW.
HUGH JONES.

(Here follows diagram marked p. 237.)

238 UNITED STATES PATENT OFFICE.

JACOB DAVID, of New York, N. Y.

Improved Curtain-Fixture.

Specification forming part of letters patent No. 69189, dated September 24, 1867.

To all whom it may concern:

Be it known that I, Jacob David, of New York city, 20 Ann street, in the county and State of New York, did invent a new and

J. David,

Shade Fixture,

No. 69,189, Patented Sept. 24, 1867.

Fig. 2

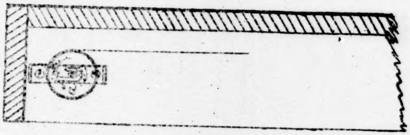


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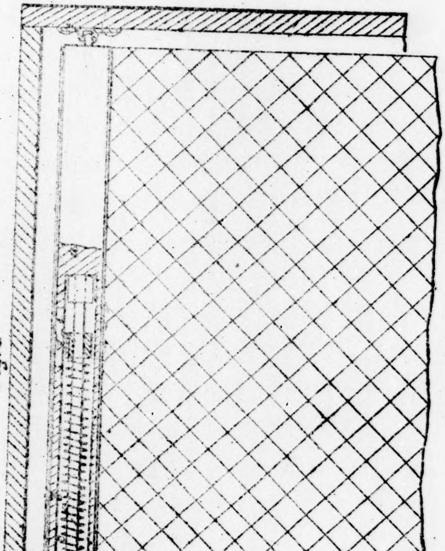
Fig. 1



Witnesses
Gustav Berg
Charles D. Jones

Inventor
Jacob David
Van Santvoord & Hauff
Atty

useful improvement in shade-fixtures; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 is a longitudinal section of a shade-roller made according to my invention. Fig. 2 is an elevation of the journal-box *f*, which performs the double office of supporting one end of the roller and of stopping its revolution when desired, and thereby preventing the winding up of the curtain.

Similar letters indicate corresponding parts.

This invention consists in a novel construction of shade-fixtures, in which I arrange the spring that winds up the shade and the detent that arrests the action of said spring in the same end of the roller, whereby I am enabled to combine a spring and detent with a common solid wooden roller, a socket for the spring being bored out in one end of the roller, and the other end being left in its natural condition, so that it can be fitted to a window by sawing off any excess in length in the same manner as plain wooden rollers without automatic spring-fixtures are now shortened and fitted.

My invention is applicable to shade-rollers of any material.

The letter *a* designates a wooden shade-roller. A cavity or socket, *b*, is bored out in one end to receive the spring *c* and the rod *d*, to which said spring is attached. The outer end rod, *d*, extends through the protecting-plate which covers the perforated end of the roller, and said outer end of the rod is squared or flattened to enable it to fit a slot of corresponding form made in the journal-box *f*, by which means the rod *d* is prevented from turning with the roller. The spring *c* is wound around the rod, one end of the spring being fastened to said rod near its outer end, and the other end of the spring being fixed to a block or cross-head, *g*, which is loose upon the rod, but which is prevented from turning by a pin, *h*, which extends from the periphery of the cross-head and enters a slot, *i*, which intersects the socket or hollow of the roller near its inner end. The slot is made long enough to allow for the sliding of the cross-head *g* along the rod to and fro as the spring is alternately shortened and lengthened on being wound and unwound upon said rod, the pin *h* moving to and fro in the slot, and preventing the cross-head from turning on the rod.

The slot in journal-box *f*, which receives the end of rod *d*, is open at its right-hand side, near the top, to let the rod enter and be removed at pleasure, the opening being so arranged and formed that one part, *j*, the left-hand side in Fig. 2, is higher than the right-hand side, and is vertical, so that it will stop at the winding up of the shade by arresting the roller through the action of the arm or detent *k*, which is hinged in a radial slot in the same end of the roller which contains the spring, said detent being arranged in the plane of the axis of the roller, its free end working through a radial slot in the protecting-plate *e*, so that the movement of the end of the arm or detent is toward and away from the axis of the roller, centrifugal action (when the roller is rapidly turned) sending the detent outward, at which times it will pass over the elevated side *j* of the journal-box *f*. When the roller is moving slowly, or is in a state of rest, the action of gravity brings the detent toward the center of the roller at these times, when the detent is above the center, and at such times said detent engages the said part *j*, and the revolution of the roller is arrested.

The height of the part *j* of the journal-box is such as to allow the arm *k* to fall against it when it is near the center of the roller, which position it occupies whenever the roller in turning brings the arm above the axis, unless when turning at a high speed, in which case centrifugal action carries the arm far enough away from the axis or center of the roller to allow it [to] pass over the side *j* of the box. The outside of the part *j* is rounded off, so that the arm *k* will ride over it with ease when the roller is being turned against its spring, as when unwinding the shade.

239 The solid end of the roller, after the roller has been sawed off and fitted to the place it is to occupy in a window, is fitted with the usual plate *l*, from the center of which projects a journal that is received in a journal-box, *m*, which is screwed to the window-casing.

My invention enables me to make use of wooden rollers in shade-fixtures which wind or draw up their shades automatically, and thereby to cheapen and simplify them, both in construction and in fitting them for use at windows, one end of the rollers being still left unoccupied and free to be cut off when it becomes necessary to shorten it on fitting the same to a window.

As a consequence of my invention it follows that the roller can be made complete in the factory and left of full length, so that it can be fitted by the upholsterer to a window merely by removing its surplus length.

All other automatic or spring rollers are made of metallic tubes of different lengths, which cannot be shortened without destroying or injuring the roller.

What I claim as new, and desire to secure by letters patent, is—

1. The arm or detent *k*, arranged upon the roller in such a manner that it moves toward and away from the center or axis of the roller *a* by the action of gravity and centrifugal force, substantially as described.

2. The combination and arrangement, at the same end of a shade-roller, of the spring *c*, rod *d*, and arm or detent *k*, or their mechanical equivalents, substantially as described.

This specification signed by me this 27th day of July, 1867.

JACOB DAVID.

Witnesses:

W. HAUFF.
GUSTAV BERG.

240 No. 69176. 1867. Fales XX. $\frac{1448}{98}$

William Campbell, of New York, county of New York, State of New York.

Window-Shade Fixtures.

Received Aug. 19, 1867.
Petition, " "
Affidavit, " "
Specification, " "
1 drawing, " "
Model, " "
Ce't dep.
Cash, $15.00, Aug. 17, 1867.
Add'l fee cert.
Add'l fee, cash $20, Sept. 12, '67.
Examined, J. T. Fales, Aug. 31, 1867.
2 issue, A. M. Stout, Sept. 4, 1867.
4 patented Sept. 24, 1867.
Recorded Vol. —, page —.
Circular, Sept. 5, '67.

MUNN & CO., *Present.*

1867.

241 Department of the Interior,
U. S. Patent Office.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the files of this office of the file-wrapper in the matter of letters patent granted William Campbell, dated September 24th, 1867, No. 69176, for improved window-shade fixtures.

In testimony whereof I, W. H. Doolittle, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this twenty-seventh day of September, in the year of our Lord one thousand eight hundred and seventy-six, and of the Independence of the United States the one hundred and first.

[SEAL.] W. H. DOOLITTLE,
Acting Commissioner.

242 The U. S. Patent Office.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the files of this office of the file-wrapper and contents in the matter of letters patent granted Jacob David, dated September 24th, 1867, No. 69189, for improved curtain-fixtures.

In testimony whereof I, Ellis Spear, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this seventh day of February, in the year of our Lord one thousand eight hundred and seventy-six, and of the Independence of the United States the one hundredth.

[SEAL.] ELLIS SPEAR,
Acting Commissioner.

243 Model, $15, check.

Petition.

To the Commissioner of Patents of the United States of America:

The petition of Jacob David, of New York, in the county of New York and State of New York, 20 Ann street, respectfully represents—

That your petitioner has invented a new and useful improvement in shade-fixtures, which he verily believes has not been known or used prior to the invention thereof by your petitioner. He therefore prays that letters patent of the United States of America may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same, upon the terms and conditions expressed in the act of Congress in that case made and provided, he having paid fifteen dollars into the Treasury of the United States and otherwise complied with the requirements of said act. And he hereby authorizes John Van Santvoord and Wm. Hauff, of the firm of Van Santvoord & Hauff, of the city of New York, or their accredited agent, to act as his attorneys in presenting the application and in making all such alterations and amendments as may be required, and to sign his name to the drawings.

JACOB DAVID.

[Inter. rev. fifty-cent stamp. J. D. July 27, 1867.]

Oath.

COUNTY OF NEW YORK,
State of New York, } *ss:*

On this 27th day of July, 1867, before the subscriber, a notary public in and for said county, personally appeared the above-named Jacob David, and made solemn oath that he verily believes himself to be the original and first inventor of the within-described improvment in shade-fixtures, and that he does not know or believe that the same was ever before known or used, and that he is a citizen of the United States.

[L. S.] W. HAUFF,
Notary Public.

244 To all whom it may concern:

Be it known that I, Jacob David, of New York city, 20 Ann street, in the county and State of New York, did invent a new and useful improvement in shade-fixtures, and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 is a longitudinal section of a shade-roller made according to my invention.

Figure 2 is an elevation of the journal-box, of which *f* performs the double office of supporting one end of the roller and of stopping its revolution when desired and thereby preventing the winding up of the curtain.

Similar letters indicate corresponding parts.

This invention consists in a novel construction of shade-fixtures in which I arrange the spring that winds up the shade and the detent that arrests the action of said spring in the same end of the roller, whereby I am enabled to combine a spring and detent with a common solid wooden roller, a socket for the spring being bored out in one end of the roller and the other end being left in its natural condition, so that it can be fitted to a window by sawing off any excess in length in the same manner as plain wooden rollers without automatic spring fixtures are now shortened and fitted. (Insert C.)

The letter *a* designates a wooden shade-roller; a cavity or socket, *b*, is bored out in one end to receive the spring *c* and the rod *d*, to which said spring is attached. The outer end rod *d* extends through the protecting plate which covers the perforated end of the roller, and said outer end of the rod is squared or flattened to enable it to fit a slot of corresponding form made in the journal-box *f*, by which means the rod *d* is prevented from turning with the roller. The spring *c* is wound around the rod, one end of the spring being fastened to said rod near its outer end, and the other end of the spring being fixed to a block or cross-head, *g*, which is loose upon the rod, but which is prevented from turning by a pin, *h*, which extends from the periphery of the cross-head and enters a slot, *i*, which intersects the socket or hollow of the roller near its inner end. The slot is made long enough to allow for the sliding of the cross-head *g* along the rod to and fro as the spring is alternately shortened and lengthened on being wound and unwound upon said rod, the pin *h* moving to and fro in the slot and preventing the cross-head from turning on the rod. The slot in journal-box *f*, which receives the end of rod *d*, is open at its right-hand side near the top to let the rod enter and be removed at pleasure, the opening being so arranged and formed that one part, *j*, the left-hand side in figure 2, is higher than the right-hand side and is vertical, so that
245 it will stop the winding up of the shade by arresting the roller through the action of the arm or detent *k*, which is hinged in a radial slot in the same end of the roller which contains the spring, said detent being arranged in the plane of the axis of the roller, its free end working through a radial slot in the protecting plate *e*, so that the movement of the end of the arm or detent is towards and away from the axis of the roller, centrifugal action, when the roller is rapidly turned, sending the detent outwards, at which times it will pass over the elevated side *j* of the journal-box *f*. When the roller is moving slowly or is in a state of rest the action of gravity brings the detent towards the centre of the roller, at the times when the detent is above the centre, and

at such times said detent engages the said part *j* and the revolution of the roller is arrested. The height of the part *j* of the journal-box is such as to allow the arm *k* to fall against it, when it is near the centre of the roller, which position it occupies whenever the roller, in turning, brings the arm above the axis, unless when turning at a high speed, in which case centrifugal action carries the arm far enough away from the axis or centre of the roller to allow it to pass over the side *j* of the box. The outside of the part *j* is rounded off so that the arm *k* will ride over it with ease when the roller is being turned against its spring, as when unwinding the shade.

The solid end of the roller, after the roller has been sawed off and fitted to the place it is to occupy in the window, is fitted with the the usual plate *l*, from the centre of which projects a journal that is received in a journal-box, *m*, which is screwed to the window-casing.

My invention enables me to make use of wooden rollers in shade-fixtures which wind or draw up their shades automatically, and thereby to cheapen and simplify them both in construction and in fitting them for use at windows, one end of the rollers being still left unoccupied and free to be cut off when it becomes necessary to shorten it on fitting the same to a window. As a consequence of my invention it follows that the roller can be made complete in the factory and left of full length, so that it can be fitted by the upholsterer merely by removing its surplus length. All other automatic or spring rollers are made of metallic tubes of different lengths, which cannot be shortened without destroying or injuring the roller.

Erase B.

> I do not claim to have invented the shortening of a wooden roller by cutting off one end, but I claim in this part of my invention to have produced an automatic wooden roller, which can be furnished complete and ready for use, of an uniform size or length, without regard to the size of the windows in which they are to be used, and can be fitted for any windows of a breadth less than the length of the roller by merely cutting off the superfluous part.

I accomplish this result by arranging both the spring and rod and the arm or detent in the same end of the roller, whereby the opposite end is left free to be cut off when it is desired to adjust and fit the roller to a window, the journal-box and journal which are now commonly used for wooden rollers being available for the solid end of the roller without requiring alteration.

246 What I claim as new, and desire to secure by letters patent, is—

1st. The arm or detent *k*, arranged upon the roller in such a manner that it moves towards and away from the centre or axis of the roller *a* by the action of gravity and centrifugal force, substantially as described.

2. The combination and arrangement, at the same end of a shade-

roller, of the spring *e*, rod *d*, and arm or detent *k*, substantially as described. (Insert G.)

Erase per Amendment A, Sept. 3, 1867.

3. An automatic wooden shade-roller, one end of which is fitted with a winding-spring and arresting arm or detent, and the other end of which is left free to be cut off in order to fit the roller to a window, substantially as described.

This specification signed by me this 27th day of July, 1867.

Witnesses: JACOB DAVID.
W. HAUFF.
GUSTAV BERG.

(Aug. 28, 1867.)

U. S. PATENT OFFICE,
WASHINGTON, D. C., *Aug.* 28, 1867.

Jacob David, care of Van Santvoord & Hauff, 41 Park Row, New York:

SIR: Please find below the communication of the examiner in charge in the matter of your application for patent for a shade-fixture, filed Aug. 8, 1867.

Very respectfully,

—— ——, *Commissioner.*

EXAMINER'S ROOM, NO. 8.

In the matter of the application above referred to the specification is returned that the parts marked with pencil on the 5th, 6th, and 7th pages may be erased.

There are several patents in which one end of the roller is left to be sawed to suit the width of the window, but not patentable when arranged with any particular means of adjustment.

J. T. FALES, *Examiner.*

247 NEW YORK, *August* 31*st*, 1867.

Hon. Comm'r of Patents:

SIR: We hereby return the specification of Jacob David for a shade-fixture, with the following amendment:

(Erase A:) 1. Erase clause 3 of the claim;

(Erase B:) Also the last four lines of page 5 and the whole of page 6.

(Insert C:) 2. Insert at the end of line 11, on page 2, the words: [My invention is applicable to shade rollers of any material.]

(Insert D:) 3. Insert after detent *r*, in the 2nd claim, the words: [Or their mechanical equivalents.]

Very respectfully,

VAN SANTVOORD & HAUFF,
Att'ys for J. David.

[NOTE.—The words in brackets are inserted.]

New York City, *Sept.* 10, 1867.

Hon. T. C. Theaker, Comm'r of Patents:

Sir: We have the honor to enclose the balance fee for Jacob David's shade fixture.

Very respectfully,

VAN SANTVOORD & HAUFF.

Jacob David. Imp't curtain-fixture. The drawing and claim show the invention.

248 No. 69189. 1867. XX. Fales. 1411
97

Jacob David, of New York, County of New York, State of New York.

Shade-Fixtures.

Received Aug. 8, 1867.
Petition, " " ".
Affidavit, " " "
Specification, " " "
2 drawing-, " 16, "
Model, " 8, "
Cert. dep.
I- cash, $15, Aug. 8, 1867.
Add'l fee cert.
1 add'l fee, cash, $20, Sept. 11, '67.
Examined J. T. Fales Sept. 3, 1867.
2 issue, A. M. Stout, Sept. 3, 1867.
3 patent-, Sept. 24, 1867, & 2 recorded, Vol. —, page —.
Circular, Sept. 6. '67.

VAN SANTVOORD & HAUFF,
41 *Park Row, N. Y.*

1867.

Ex'd: H. Spec. ret'd Aug. 28, 1867.

249 Department of the Interior,
United States Patent Office.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed are true copies from the records of this office of five (5) assignments, found of record under letters patent No. 69189, recorded in the volumes as stated on the margin of each copy, and that said records have been carefully compared with the originals, and are correct transcripts thereof.

In testimony whereof I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be affixed this twenty-fifth day of February, in the year of our Lord one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and sixth.

[seal.] E. M. MARBLE,
Commissioner.

250 *Assignment.*

Liber X 9, page 79.

Whereas I, Jacob David, of number 20 Ann street, in the city of New York, State of New York, did obtain letters patent of the United States of America for certain improvements in curtain-fixtures, which letters patent bear date the 24th day of September, eighteen hundred and sixty-seven, and are numbered 69189;

And whereas Turner, Seymour and Judds, of No. 64 Duane street, in the said city, a corporation organized under the laws of the State of Connecticut, are desirous of acquiring an interest therein:

Now this indenture witnesseth: That for and in consideration of the sum of five dollars, to me, the said Jacob David, in hand paid, the receipt of which is hereby acknowledged, I have assigned, sold, and set over, and do hereby assign, sell, and set over, unto the said Turner, Seymour and Judds all the right, title, and interest which I have in the said invention as secured to me by said letters patent, the same to be held and enjoyed by the said Turner, Seymour and Judds, and their successors and assigns, for their own use and behoof, and for the use and behoof of their legal representatives, to the full end of the term for which said letters patents are granted, as fully and entirely as the same would have been held and enjoyed by me if this assignment and sale had not been made.

In testimony whereof I hereunto set my hand and affix my seal this twenty-eighth day of October, eighteen hundred and sixty-seven.

JACOB DAVID. [SEAL.]

5 5
J. D.
Oct. 28.
1867.
5 5

Sealed and delivered in presence of—
J. VAN SANTVOORD.

Recorded Nov. 2, 1867.
Ex'd: H. M. H. E. A. M.

251 Liber T 16, page 406.

Know all men by these presents that we, Turner, Seymour & Judds, a corporation of Wolcottville, in the State of Connecticut, sole owners of all right, title, and interest whatsoever in, to, and under letters patent of the United States No. 69189, granted September 24th, 1867, to Jacob David for curtain-fixture, by assignment from Jacob David, of the city and State of New York, dated October 28th, 1867, duly recorded in the United States Patent Office, in consideration of one dollar to us in hand paid by the Salem Shade Roller Manufacturing Company, a corporation duly created by the State of Massachusetts, having their principal place of business at Salem, in said State, the receipt whereof is hereby acknowledged, have assigned, sold, and set over, and so hereby assign, sell, and set over, unto said corporation, its successors and assigns, all right, title, and interest whatsoever in, to, and under said letters patent, and also in and to all rights of action or suit for infringement of said letters patent since the date of said assignment to us; and in and to all damages sustained by us by reason of infringement of said letters patent since said date; and in and to all gains and profits made or received by any and all persons by reason of the unlawful manufacture, use, or sale of the invention described in said letters, or of any material or substantial part of said invention.

To have and to hold to said corporation, its successors and assigns, for and during the full term for which said letters patent are granted as fully and entirely as we might have had and held the same had not this assignment been made.

And we hereby authorize and empower said corporation, its successors and assigns, to do all and singular whatever we might lawfully do in regard to said damages, gains, and profits for their own use and behoof and at their expense.

In testimony whereof Frederick J. Seymour, treasurer of the said corporation, has hereunto affixed his signature and seal and the name of the company and by its authority this eleventh day of June, A. D. one thousand eight hundred and seventy-three.

TURNER, SEYMOUR & JUDDS.
F. J. SEYMOUR, *Treas.* [SEAL.]

Sealed and delivered in the presence of—
LEMUEL W. SERRELL.

Recorded June 12th, 1873.
Ex'd: J. A. W., M. McK.

252 Liber N 21, p. 221.

Know all men by these presents, that we, the Salem Shade Roller Manufacturing Company, a corporation established by the State of Massachusetts, and having its principal place of business at Salem, in the said State, in consideration of one dollar to us in hand paid by Daniel Low, James F. Almy, and Albert B. Russell, all of said Salem, the receipt of which is hereby acknowledged, have sold, assigned, and transferred, and do hereby sell, assign, and transfer, unto the said Low, Almy, & Russell, their legal representatives and assigns, all right, title, and interest in, to, and under the following letters patent of the United States:

No. 66970, granted to Ezra B. Lake July 23rd, 1867.
No. 69189, granted Jacob David September 24, 1867.
No. 111,967, granted Phineas W. Phillips Feb. 21, 1871.
No. 120,997, granted Phineas W. Phillips November 14th, 1871.
No. 155,522, granted to Ezra B. Lake September 29th, 1874.
No. 155,523, granted to Ezra B. Lake September 29th, 1874.
No. 159,424, granted to Ezra B. Lake February 2nd, 1875.
No. 162,666, granted to Ezra B. Lake April 27th, 1875.
No. 165,861, granted to Phineous W. Phillips July 20th, 1875.
No. 169,450, granted to Ezra B. Lake November 2nd, 1875.
No. 170,277, granted to Ezra B. Lake November 23rd, 1875.

No. 176,015, granted to J. Christopher Lake April 11th, 1876.

No. 176,434, granted to Ezra B. Lake April 25th, 1876.

No. 185,549, granted to the said Salem Shade Roller Manufacturing Company December 19th, 1876.

No. 185,550, granted to the said Salem Shade Roller Manufacturing Company December 19th, 1876.

No. 185,762, granted to the said Salem Shade Roller Manufacturing Company December 26th, 1876.

No. 185,763, granted to the said Salem Shade Roller Manufacturing Company December 26th, 1876.

Reissue No. 5439, granted to the said Salem Shade Roller Manufacturing Company June 3rd, 1873.

Reissue No. 5858, granted to the said Salem Shade Roller Manufacturing Company April 28th, 1874, and the inventions therein described. Also all right, title, and interest in, to, and under the invention for which Phineas W. Phillips has made application for letters patent, now pending in the United States Patent Office, and in, to, and under letters patent therefor when granted the same, to be had and held by the said Low, Almy, and Russell to their own use and behoof, and to the use and behoof of their legal representatives and assigns, to the full end of the term for which the said letters patent are or may be granted as fully and entirely as they would have been had and held by us had not this assignment been made.

And we hereby further sell, assign, and transfer to the said Low, Almy, and Russell all claims and demands whatsoever in anywise based upon or arising out of any or all infringements of said letters patent, or any of them, including our rights in a certain suit brought by us and now pending in the circuit court of the 253 United States for the southern district of New York against Stewart Hartshorn, a citizen of the State of New York.

And we hereby make and constitute said Low, Almy, Russell our attorneys, irrevocable, with full power in our name or otherwise to collect all such claims and demands, prosecute the suit above named, to bring all other suits and actions necessary and proper in the premises, and to collect whatsoever may be due us in the premises, but for their own use. And we hereby authorize and request the Commissioner of Patents to issue the said letters patent applied for by said Phineas W. Phillips to the said Low, Almy, and Russell, as assignees of the entire right, title, and interest in, under the same, for the sole use and behoof of the said Low, Almy, and Russell, and their legal representatives and assigns.

In testimony whereof we have caused our corporate name to be set by our treasurer, duly authorized, and our corporate seal to be hereto affixed this fourteenth day of April, A. D. 1877.

SALEM SHADE MA'F'G CO,
By W. R. BIGELOW, *Treas.* [SEAL.]

In presence of—
JEROME FISKE.

Recorded April 23rd, 1877.
Ex'd: J. A. W. M. McK.

254 Liber H 23, page 460.

Know all men by these presents that we, Daniel Low, James F. Almy, and Albert B. Russell, all of Salem, in the State of Massachusetts, in consideration of one dollar to us in hand paid by James E. Maynadier, of Boston, in said State, the receipt of which is hereby acknowledged, and of a declaration of trust, of even date herewith, signed by said Maynadier, have sold, assigned, and conveyed, and do hereby sell, assign, and convey, unto said Maynadier the entire right, title, and interest in, to, and under the following letters patent of the United States:

No. 66970, granted to Ezra B. Lake July 23, 1867.
No. 69189, granted to Jacob David Sept. 24th, 1867.
No. 111,967, granted to Phineas W. Phillips Feb. 21st, 1871.
No. 120,997, granted to Phineas W. Phillips Nov. 14th, 1871.
No. 155,522, granted Ezra B. Lake Sept. 29, 1874.
No. 155,523, granted to Ezra B. Lake Sept. 29th, 1874.
No. 159,424, granted to Ezra B, Lake Feb. 2nd, 1875.
No. 162,666, granted to Ezra B. Lake April 27th, 1875.
No. 165,861, granted to Phineas W. Phillips July 2nd, 1875.
No. 169,450, granted to Ezra B. Lake Nov. 2nd, 1875.
No. 170,277, granted to Ezra B. Lake Nov. 23rd, 1875.
No. 176,015, granted to J. Christopher Lake April 11th, 1876.
No. 176,434, granted to Ezra B. Lake April 25th, 1876.
No. 185,549, granted to the Salem Shade Roller Manufacturing Company Dec. 19, 1876.
No. 185,550, granted to the Salem Shade Roller Manufacturing Company Dec. 19, 1876.
No. 185,762, granted to the Salem Shade Roller Manufacturing Company Dec. 26th, 1876.
No. 185,763, granted to the Salem Shade Roller Manufacturing Company Dec. 26th, 1876.
No. 189,781, granted to Phineas W. Phillips April 17th, '77.
Reissue No. 5439, granted to the Salem Shade Roller Manufacturing Company June 3, 1873.
Reissue No. 5858, granted to the Salem Shade Roller Manufacturing Company April 28th, 1874.

And in and to the inventions in each described; also all claims and demands whatsoever in anywise based upon or arising out of any and all infringements of said letters —, or of any of them, including our rights in a certain suit brought by the Salem Shade Roller Manufacturing Company, a corporation established by said State, and now pending in the circuit court of the United States for the southern district of New York, against Stewart Hartshorn, a citizen of the State of New York; to have and to hold to him, said Maynadier, his legal representatives and assigns, to the full end of the term for which said letters patent are or may be granted, as fully and entirely as the same would have been had and held by us had this sale and assignment not been made, but, nevertheless, strictly in trust for the persons and purposes specified, and to be

held and disposed of as stated in a certain declaration of
255 trust made by said Maynadier and dated this first day of
August, 1878, and not otherwise.

Witness our hands and seals this first day of August, 1878.

JAMES F. ALMY. [SEAL.]
DANIEL LOW. [SEAL.]
ALBERT B. RUSSELL. [SEAL.]

Recorded Oct. 26th, 1878.
Ex'd: J. A. W. M. M., c'k.

Liber W 26, page 184.

Be it known that whereas we, James F. Almy, Albert B. Russell, Daniel Low, and James E. Maynedier, trustee, are owners of the following specified letters patent of the United States, granted to secure inventions relating to curtain-fixtures or window-shade fixtures, or to auxiliary contrivances, namely:

No. 66970, granted to Ezra B. Lake July 23rd, 1867.

No. 67465, granted to L. A. Tripp and S. M. Boyd August 6th, 1867.

No. 69189, granted to Jacob David September 24th, 1867.

No. 111,967, granted to Phineas W. Phillips February 21st, 1871.

No. 120,997, granted to Phineas W. Phillips November 14th, 1871.

No. 155,522, granted to Ezra B. Lake September 29th, 1874.

No. 155,523, granted to Ezra B. Lake September 29th, 1874.

No. 159,424, granted to Ezra B. Lake February 2nd, 1875.

No. 94866, granted to Jabez Birnes September 14th, 1869.

No. 162,666, granted to Ezra B. Lake April 27th, 1875.

No. 165,861, granted to Phineas W. Phillips July 20th, 1875.

No. 169,450, granted to Ezra B. Lake November 2nd, 1875.

No. 170,277, granted to Ezra B. Lake November 23rd, 1875.

No. 176,015, granted to J. Christopher Lake April 11th, 1876.

No. 176,434, granted to Ezra B. Lake April 25th, 1876.

No. 185,549, granted to the Salem Shade Roller Manufacturing Company Dec. 19th, 1876.

No. 185,550, granted to the said Salem Shade Roller Manufacturing Company Dec. 19th, 1876.

No. 185,762, granted to the said Salem Shade Roller Manufacturing Company Dec. 26th, 1876.

No. 185,763, granted to the said Salem Shade Roller Manufacturing Company Dec. 26th, 1876.

No. 189,781, granted to Phineas W. Phillips April 17th, 1877.

No. 189,798, granted to A. B. Shaw April 17th, 1877.

Reissue No. 8404, granted to the said Salem Shade Roller Manufacturing Company September 10th, 1878.

Reissue No. 5,439, granted to the said Salem Shade Roller Manufacturing Company June 3rd, 1873.

256 Now, therefore, we, the said James F. Almy, Albert B. Russell, Daniel Low, and James E. Maynedier, trustee, for and in consideration of the sum of ten thousand dollars ($10,000) to us paid by Stewart Hartshorn, of Milburn, in the State of New Jersey, the

receipt of which is acknowledged, do hereby sell, assign, transfer, convey, and set over to said Stewart Hartshorn, his heirs and assigns, all our right, title, and interest in and to the said letters patent, the inventions therein set forth, and the exclusive privileges secured thereby, to have and to hold the same unto him, the said Stewart Hartshorn, his heirs and assigns, for and during the remainder of the term for which said letters patent and each of them were granted, and for any reissues or extensions thereof.

In witness whereof we have hereto set our hands and seals this second day of June, A. D. 1881.

J. E. MAYNEDIER, *Trustee.* [SEAL.]
JAMES F. ALMY. [SEAL.]
DANIEL LOW. [SEAL.]
A. B. RUSSELL. [SEAL.]

Recorded June 9, 1881.
In presence of—
JOHN R. SNOW,
GEO. C. ROGERS,
Wit. to J. F. A. & D. L. & A. B. R.

Ex'd: H. M. H. E. A. M.

257 At a stated term of the circuit court of the United States of America for the second circuit and southern district of New York, held at the city of New York on the 10th day of August, in the year of our Lord one thousand eight hundred and eighty.

Present: The Honorable Samuel Blatchford, circuit judge.

STEWART HARTSHORN *vs.* CHARLES FLOSS.

The bill of complaint in the above-entitled cause having been taken *pro confesso* against the defendant for want of appearance, and S. D. Law having been heard on the part of the complainant, and the same having been duly considered by the court:

Now, at this term of said court, it is found and hereby ordered, adjudged, and decreed that the reissued letters patent No. 2756, for improvement in shade-fixtures, granted to the complainant, Stewart Hartshorn, on the 27th day of August, 1867, and the reissued letters patent No. 7367, for improvement in curtain-fixtures, granted to the complainant, as assignee of William Campbell, on the 31st day of October, 1876, being the patents referred to in the complainant's bill, are good and valid patents; that the said Stewart Hartshorn and William Campbell were severally the first and original inventors of the inventions or improvements respectively described and claimed in said reissues No. 2756 and No. 7367; and also that the said defendant has infringed upon the said patents, and upon the exclusive rights of the complainant under the same by making, using, and vending to be used shade-rollers containing the improvements described and claimed in said reissue No. 2756, and in the first and second claims of said reissue No. 7367.

And it is further ordered, adjudged, and decreed that the complainant do recover of the defendant the profits, gains, and advantages which the said defendant, Charles Floss, has received or made, or which have arisen or *occurred* to him from said infringement of the said patents by the manufacture, use, or sale of shade-rollers containing the improvements described and secured by the said reissued letters patents Nos. 2756 & 7367.

And it is further ordered, adjudged, and decreed that the said complainant do recover of the defendant his costs and charges and disbursements in this suit, to be taxed.

And it is further ordered, adjudged, and decreed that it be referred to Joseph Gutman, Jr., one of the masters of this court, residing in the city of New York, to ascertain and take and state 258 and report to the court the number or quantity of shade-rollers made, used, or vended to be used by the defendant employing and using the said improvements, and also the gains, profits, and advantages which the said defendant, Charles Floss, has received, or which have arisen or accrued to him from infringing the said exclusive rights of the said complainant by the manufacture, use, and sale of the said improvements patented in said reissued letters patent Nos. 2756 and 7367; and that he also ascertain, assess, and report what, if any, damages said complainant has suffered or sustained by reason of said infringement over and above or beyond such gains and profits.

And it is further ordered, adjudged, and decreed that the complainant on such accounting have the right to cause an examination of said defendant, Charles Floss, *ore tenus* or otherwise, and also the production of the books, vouchers, and documents of said Floss; and that the defendant attend for such purpose before said master, from time to time, as said master shall direct.

And it is also further ordered, adjudged, and decreed that a perpetual injunction be issued in this suit against the said defendant, according to the prayer of the bill.

(S'g'd) SAM'L BLATCHFORD.

A true copy.
[SEAL.] JOSEPH M. DEUEL, *Clerk.*

E. P. M.

259 *Order for Preliminary Injunction.*

At a stated term of the circuit court of the United State of America for the southern district of New York, in the second circuit, held at the United States court-rooms, in the city of New York, on the 15th day of May, in the year of our Lord one thousand eight hundred and eighty.

Present: The Honorable Samuel Blatchford, circuit judge.

STEWART HARTSHORN *vs.* CHARLES FLOSS.

On reading and filing the bill of complaint in this cause, alleging the infringement of reissued patents Nos. 2756 and 7367, for improvements in shade-rollers, and the exhibits attached thereto, and the affidavits of J. H. C. Neviuss, Stewart Hartshorn, and S. P. Kittle, on the part of the complainant, and the affidavit of the defendant, Charles Floss, in his own behalf, and after hearing S. D. Law on the part of the complainant and Arthur P. Hinman on the part of the defendant:

Ordered, That an injunction issue according to the prayer of the bill, to restrain the defendant, Charles Floss, his agents, servants, and workmen, from making, using, or vending to be used shade-rollers employing or using in their construction the invention or arrangement of parts described and claimed in the said reissue No. 2756 and in the first and second claims of the said reissue No. 7367 until the further order of this court.

(Signed) SAM'L BLATCHFORD.

A true copy.
[L. S.] J. M. DEUEL, *Clerk.*

260 At a stated term of the circuit court of the United States for the southern district of New York, in the second circuit, held at the court-rooms thereof, in the city of New York, on the 31st day of May, 1881.

Present: Hon. Samuel Blatchford, circuit judge.

STEWART HARTSHORN *vs.* CHARLES FLOSS.

A decree having been duly entered in this cause on the 10th day of August, 1880, by which it was ordered, adjudged, and decreed that a perpetual injunction issue against the said defendant, Charles Floss, restraining him from infringing complainant's patents, reissue No. 2756, and the first and second claims of reissued patent No. 7367, for improvements in shade-rollers, on which said patents this suit was brought; and an injunction having been issued in pursuance of said decree, and the same having been returned and the return filed, and it appearing therefrom that said injunction was duly served on said defendant, Charles Floss, on the 24th day of August, 1880, which injunction commanded and enjoined the said defendant, his attorneys, agents, servants, and workmen, and each of them, to forthwith and forever to refrain and desist from making, using, or vending to others to be used, in violation of said patents, any shade-rollers containing the improvement described and claimed in reissue 2756 and in the first and second claims of reissue No. 7367.

261 Upon reading and filing notice of motion in this cause and proof of service thereof on the defendant, Charles Floss, for an attachment against him, the said Charles Floss, to compel him to appear before this court to answer for his contempt in violating the said injunction, and upon reading and filing, on the part of the complainant, the affidavits of Stewart Hartshorn, the complainant; Edward Winter, John H. C. Neviuss, Nelson Griffen, William T. Smith, and S. P. Kittle, and papers accompanying said notice, and affidavit of said Charles Floss, read in opposition thereto, and after hearing S. D. Law, of counsel for complainant, and A. P. Hinman, counsel for defendant—

Upon consideration, it is ordered, adjudged, and decreed that said defendant, Charles Floss, is in contempt of this court, and has violated the said injunction in that the said defendant has, since the service upon him of said injunction, made, used, and sold shade-rollers containing and embodying the inventions and improvements substantially like and the equivalent of those shown and described and claimed in said reissue No. 2756, and shown and described and claimed in the first and second claims of said reissue No. 7367. And it is further ordered that a writ of attachment issue against the said defendant, Charles Floss, directed to the marshal of the United States for the southern district of New York, commanding him to attach the body of the said Charles Floss and produce the same before this court, at a term thereof to be held at the United States court-rooms, in the city of New York, on the 1st day of June, 1881, at the opening of the court on that day, then and there to answer for the breaches of the defendant of the injunction heretofore issued and served on the defendant herein, and for such other matters as shall be laid to his charge, and to abide by and perform such other and further order as may be made in the premises, and that on said writ of attachment said defendant make and deliver to this court his bond, to be approved by the court, in the sum of five hundred dollars, payable to the complainant in 262 this suit, his executors, administrators, and assigns, conditioned that said defendant, Charles Floss, will at once and forever hereafter cease his infringement in any manner of said patents, reissues Nos. 2756 and 7367, or either of them, and that on the approval of such bond by the court the said defendant be released from the custody of the marshal under said attachment.

And it is further ordered that it be referred to John A. Shields, Esq., as special master, to take proof as to the extent of such infringement by the defendant, and of the violation of said injunction, and of the damages, costs, and expenses caused to the complainant thereby, including the costs of this proceeding, and that he report the same to this court with all convenient speed.

(Signed) SAM'L BLATCHFORD.

A copy.
[L. S.] J. M. DEUEL, *Clerk.*

263 At a stated term of the circuit court of the United States of America for the circuit and district of New Jersey, held at the city of Trenton, on the 28th day of Sept., 1878.

Present: Honorable John T. Nixon, D. J.

STEWART HARTSHORN *vs.* MELLVILLE A. FRASER.

This cause having been brought to a final hearing on the bill taken as confessed against the defendant, Mellville A. Fraser, and S. D. Law, Esq., having been heard on the part of complainant, and no one appearing on behalf of the defendant, and the same having been duly considered by the court:

Now, at this term of said court, on motion of S. D. Law, Esq., solicitor for complainant, it is found and hereby ordered, adjudged, and decreed that the reissued letters patent Nos. 2756, 7367, & 7370, granted unto the complainant, being the patent referred to in the complainant's bill, are severally, and that the said complainant was the original and first inventor of the improvements described and claimed in the said patent reissues 2756 & 7370, and William Campbell was the original and first inventor of the improvement described and claimed in the reissue No. 7367, and also that the said defendant has infringed upon the said patent and upon the exclusive rights of the complainant under the same.

And is further ordered, adjudged, and decreed that the complainant do recover of the defendant the profits, gains, and advantages which the said defendant, Mellville A. Fraser, has received or made, or which have arisen or accrued to him from said infringement of the said patents by the manufacture, use, or sale of the improvements described and secured by the said reissued letters patent Nos. 2756, 7367, & 7370.

And it is further ordered, adjudged, and decreed that the said complainant do recover of the defendant his costs and charges and disbursements in this suit, to be taxed.

And it is further ordered, adjudged, and decreed that it is referred to S. D. Oliphant, one of the masters of this court, residing in Trenton, N. J., to ascertain and take and state and report to the court an account of the gains, profits, and advantages which the said defendant, Mellville A. Fraser, has received, or which have arisen or accrued to him since the granting of said letters patent from infringing the said exclusive rights of the said complainant by the manufacture, use, and sale of the said improvements patented in said several letters patent.

264 And it is further ordered, adjudged, and decreed that the complainant, on such accounting, have the right to cause an examination of said defendant, Mellville A. Fraser, *ore tenus* or otherwise, and also the production of the books, vouchers, and documents of said Fraser, and that the said defendant attend for such purpose before said master, from time to time, as said master shall direct.

And it is also further ordered, adjudged, and decreed that a perpetual injunction be issued in this suit against the said defendant, according to the prayer of the bill.

JNO. T. NIXON, *J.*

A true copy.

S. D. OLIPHANT, *Clerk.*

Circuit Court of the United States, District of Massachusetts. In Equity.

Salem Shade Roller Manufacturing Company
vs.
William G. Harris.

To the honorable the judges of the circuit court of the United States for the first circuit within and for the district of Massachusetts, sitting in equity:

The Salem Shade Roller Manufacturing Company, a corporation duly established by the State of Massachusetts, having its principal place of business at Salem, in said district, brings this its bill of complaint against William G. Harris, of Boston, in said district, and a citizen of the said State.

And thereupon your orator complains and says that by the letters patent of the United States of America, numbered 5439, reissue, dated June 3, 1873, signed by the Secretary of the Interior and countersigned and sealed with the seal of the Patent Office, there was granted to your orator, its successors or assigns, for the the term of seventeen years from the sixth day of August, 1867, the exclusive right to make, use, and vend a certain invention, being an improvement in curtain-fixtures, therein fully described, throughout the United States and the Territories thereof, all which by said letters patent, or by a certified copy thereof, now in court produced and shown to your honors, will more fully appear.

And your orator further shows unto your honors that by the letters patent of the United States of America, numbered 69189, dated September 24, 1867, signed by the Secretary of the Interior and countersigned and sealed with the seal of the Patent Office, there *were* granted to one Jacob David, his heirs, administrators, or assigns, for the term of seventeen years from the twenty-fourth day of September, 1867, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, a certain invention, being an improved curtain-fixture, a description whereof is given in the schedule annexed to and made a part of said letters patent, all which by said letters patent, or by a certified copy thereof, now produced and shown to your honors, will more fully appear.

And your orator further shows unto your honors that on the eleventh day of June, 1873, by mesne assignments, duly executed and recorded in the United States Patent Office, all right, title, and interest in, to, and under said letters patent became vested in it, all which by said assignments, with the certificates of the recording thereof thereon indorsed, or by certified copies thereof, now produced and shown to your honors, will more fully appear.

Yet the defendant, on the said eleventh day of June, and on divers other days since that time, at said Boston, and divers other places within the United States, has made, used, and sold many curtain-fixtures, each of which embraces in its construction and mode of

operation the inventions described in said letters patent, re-
266 spectively, and still continues so to do, in violation of the rights secured to your orator by said letters patent, respectively, but how many your orator is unable to set forth, but he prays that the respondent may discover and set forth in answer to this bill.

And that the defendant may answer the premises and that he may be decreed to account for and pay over to your orator all such gains and profits as have accrued to him from such manufacture and sale or other use of said inventions, and that your orator recover of the defendant, in addition to such gains and profits, the damages it has sustained by the infringement herein complained of to be assessed and such additional sum as to your honors may seem meet; and that the defendant be restrained by an interlocutory injunction and also by a final injunction, issuing each out of this honorable court, from making, using, or vending any one or more of said curtain-fixtures substantially the same as the curtain-fixture described in said letters patent, respectively, or in either of said letter patent, or any curtain-fixture embracing substantially and in principle the same construction and mode of operation; and that your orator may have such other and further relief as the nature of the case may require and to your honors may seem meet.

May it please your honors to grant unto your orator not only the writs of injunction conformable to the prayer of this bill, but also the writ to subpœna directed to the said William G. Harris, commanding him to appear and answer to this bill of complaint and to do and receive what to your honors may seem meet, and your orator will ever pray, etc.

SALEM SHADE ROLLER MANUFACTURING COMPANY,
By J. E. MAYNADIER, *Its Solicitor.*

J. E. MAYNADIER,
Of Counsel.

Answer. Filed Nov. 3, 1873.

The answer of William G. Harris, the defendant, to the bill of complaint of the said above-named complainant.

This defendant, now and at all times hereafter saving and reserving to himself all and all manner of benefits and advantages of exceptions to the many errors and insufficiencies in the complainant's said bill of complaint contained, for answer thereunto, or under so much or such parts thereof as the said defendant is advised is material for him to make answer unto, answering, says that he is informed and believes, and therefore admits, that letters patent of the United States for an improvement in curtain-fixtures, and being reissue No. 5439, were granted to the complainant in this suit, its successors and assigns, which said letters patent bear date the third day of June, 1873, as is set forth in said bill of complaint; but this defendant does not know and is not informed whether the application for said letters patent was made as required by law to be made or whether said letters patent *was* duly, legally, and properly granted, and he leaves the complainant to make such proof of the said several matters as it may be advised.

267 And this defendant, further answering, says he is informed and believes that the said letters patent so granted to said complainant, and bearing date the said third day of June, 1873, were so issued by the Commissioner of Patents upon the surrender of certain letters patent granted to L. A. Tripp and S. M. Boyd, as assignees of said L. A. Tripp, bearing date the 6th day of August, 1867; but this defendant is not informed and does not know whether such surrender was made and such proceedings had thereon as is required by law, and leaves the complainant to make proof thereof as it may be advised.

And this defendant, further answering, on information and belief, denies that said original patent was surrendered to the Commissioner of Patents and the reissue thereof obtained for good and lawful cause or because the said original patent was inoperative and invalid by reason of a defective or insufficient description or specification, or by reason of the patentee, said L. A. Trip, claiming in his specification, as his own invention, more than he had a right to claim as new; and this defendant further alleges, if said original letters patent were or had been so inoperative or invalid, that such error, defect, or insufficiency did not arise by inadvertency, accident, or mistake, and without any fraudulent or deceptive intention on the part of the said L. A. Tripp; but, on the contrary, this defendant, on like information and belief, alleges that such surrender of said letters patent, bearing date the 6th day of August, 1867, was made for other and different causes than those for which letters patent can be lawfully surrendered, and, among other things, was made to obtain, and that said complainant did obtain, contrary to the provisions of the statute in such cases made and provided, said reissued letters patent for more and other matters and things than those of which said L. A. Tripp was the first and original inventor, and more than were described or included in the specification attached to the original patent of August 6th, 1867, and that said reissued letters patent on which this suit is brought does include and embrace inventions and things of which said L. A. Tripp was not the original and first inventor. and that said reissued letters patent are not for the same invention for which said original letters patent were issued; and this defendant is advised and believes and will insist that said reissued letters patent No. 5439, of June 3, 1873, are void and of no effect.

This defendant, further answering, says that he is informed and believes and therefore admits that letters patent of the United States for an improved curtain-fixture were granted to Jacob David for such alleged improvements, which said letters patent bear date the 24th day of Sept., 1867, and are numbered 69189, as is set forth in said bill of complaint; but this defendant does not know and is not informed whether the application for said letters patent was made by said Jacob David as required by law to be made, or whether said letters patent were duly, legally, and properly granted, and he leaves the complainant to make such proof of the said several matters as it may be advised.

This defendant, further answering, says that he is not informed, save by the bill of complaint, whether the said letters patent, or either of them, were or have been assigned to the complainant in this cause, as is alleged in the bill of complaint, and he
268 therefore neither admits nor denies the same, and leaves the said complainant to make proof thereof as it may be advised.

This defendant, further answering, on information and belief, denies that the said L. A. Tripp was the first and original inventor or discoverer of the invention of the thing described and patented, or of a substantial and material part thereof claimed as new in the said reissued letters patent No. 5439, so granted to the complainant on the said 3rd day of June, 1873.

And this defendant, on like information and belief, says that the said alleged invention described and patented in said reissued letters patent No. 5430, or material and substantial parts thereof, had been anterior to any supposed discovery or invention thereof by the said L. A. Tripp, known to and used by divers persons in the United States and elsewhere, and, among others, to the several persons hereinafter mentioned, and to many other persons whose names and residences are at present unknown to this defendant, but whose names and residences, when learned, this defendant prays leave to insert, by proper allegations, in this his answer:

To Stewart Hartshorn, residing at Milburn, in the State of New Jersey, and who had knowledge of the same and used the same at the city of New York.

To Thomas Tracy, employed in the factory of Stewart Hartshorn, East Newark, New Jersey, residing in Brooklyn, State of New York, and who had knowledge of the same being made in the factory of Stewart Hartshorn, northwest corner Fourth avenue and Tenth street, in the city of New York.

To Joseph Randall, residing at New Newark, State of New Jersey, and who had knowledge of the same at the city of New York.

To William Brown, residing in the city of Paterson, State of New Jersey, and who had knowledge of the same at the city of New York.

To Frank Trask, residing in the city of New York—address, Station A, post office, Spring street, New York—and who had knowledge of the same at the said city of New York.

To Andrew J. Smith, residing at 233 East Thirtieth street, in the city of New York, and who had knowledge of the same in said city.

And this defendant, further answering, on like information and belief, says that the said alleged invention and improvement described in and patented by said reissued letters patent No. 5439, so granted on said third day of June, 1873, or substantial and material parts thereof, had been, anterior to any supposed invention or discovery thereof by said L. A. Tripp, substantially described and set forth, in whole or in part, in various public works or printed publications, and in letters patent granted in the United States and elsewhere, and, among others, in the following:

In letters patent of the United States No. 44624, granted to Stewart Hartshorn October 11, 1864, and reissued to said Hartshorn August 27, 1867, and numbered 2756.

This defendant, further answering, says that the arrangement, in combination with a spring-roller, of the pawl or detent on the fixed bracket, and of the ratchet or notched hub on the roller, as
269 is described and shown in said patent so granted to said
Stewart Hartshorn on the eleventh day of October, 1864, being well known, he is advised and believes that the transferring of the pawl or detent from the bracket to the roller, and of the ratchet or notched hub from the roller to the ratchet is but a change in position of such parts, and only mechanical in its character, and does not amount to invention, within the meaning and intent of the patent law, and that the said alleged invention of said Tripp, which was in fact only such a change of such parts, was not patentable under a proper interpretation of the statutes as to patents, and that said patent so granted to said Tripp and Boyd and its said reissue are null and void.

This defendant, further answering, on information and belief, denies that the said Jacob David was the first and original inventor or discoverer of the invention or the thing described and patented, or of a substantial and material part thereof, claimed as new in the said letters patent No. 69189, so granted to him on the said 24th day of September, 1867.

And this defendant, on like information and belief, says that the said alleged invention described and patented in said letters patent No. 69189, or material and substantial parts thereof, had been, anterior to any supposed discovery or invention thereof by the said Jacob David, known to and used by divers persons in the United States and elsewhere, and, among others, to the several persons hereinafter mentioned, and to other persons whose names and residences are at present unknown to this defendant, but whose names and residences, when learned, this defendant prays leave to insert by proper allegations in this his answer:

To Stewart Hartshorn, residing at Milburn, in the State of New Jersey, and who had known of the same and used the same at the city of New York.

To Thomas Tracy, employed in the factory of Stewart Hartshorn, East Newark, New Jersey, residing in Brooklyn, State of New York, and who had knowledge of the same being made in the factory of Stewart Hartshorn, N. W. corner 4th avenue and 10th street, in the city of New York.

To William Brown, residing in the city of Paterson, State of New Jersey, and who had knowledge of the same at the city of New York.

To Frank Trask, residing in the city of New York—address, Station A, post-office, Spring street, New York—and who had knowledge of the same at the said city of New York.

To Joseph Randall, residing at East Newark, State of New Jersey, and who had knowledge of the same at the city of New York.

To Andrew J. Smith, residing at 223 East 30th street, in the city of New York, and who had knowledge of the same at said city.

And this defendant, further answering, on like information and belief, says that the said alleged invention and improvement described in and patented by said letters patent No. 69189, so granted on said 24th day of September, 1867, or substantial and material parts thereof, had been, anterior to any supposed invention or discovery thereof by said Jacob David, substantially described and set forth, in whole or in part, in various public works or printed publications, and in letters patent granted in the United States and elsewhere, and among others in the following:

270 In letters patent of the United States No. 68502, granted to Stewart Hartshorn September 3, 1867, and reissued to said Hartshorn September 2, 1873, and numbered 5558.

This defendant, further answering, says that he is not now and never has been engaged in the manufacture of shade-rollers, but admits that he has heretofore sold and is now selling shade-rollers having a spring to roll up the shade, and fitted with a pawl or detent and ratchet or notched hub to hold the shade in any position.

And this defendant, further answering, says, as he is advised and believes, he has good and lawful right and liberty to sell such shade-rollers without any interference or molestation from said complainant, and that said complainant has no right or authority to ask for or demand from this defendant any profits which defendant may make from such sale, or claim any damages by reason thereof.

This defendant, further answering, says, as he is advised and believes, and therefore alleges and will insist upon and maintain, that the said shade-rollers so sold by him do not embrace in their construction and mode of operation the inventions described in said letters patent of complainant, as is alleged in said bill of complaint, and do not infringe upon any of the rights and privileges secured thereby.

And this defendant denies all and all manner of infringement of any of the rights or privileges belonging to the complainant, and all intention to injure or destroy any rights or privileges secured to or belonging to the complainant, or to deprive it of any gains or profits to which it may be legally entitled by virtue of the premises.

And this defendant, further answering, denies that the said complainant is entitled to the relief or any part thereof in its said complaint demanded.

And this defendant prays the same advantage of his aforesaid answer, as if he had pleaded or demurred to the said bill of complaint, without this, that any matter or thing therein contained, and not specifically admitted or denied, is true to the knowledge of this defendant.

All of which matters and things this defendant is ready and willing to aver, maintain, and prove as this honorable court shall direct, and he prays hence to be dismissed with his reasonable costs and charges in this behalf most wrongfully sustained.

WILLIAM G. HARRIS.

S. D. LAW,
Solicitor for Defendant and of Counsel.

DISTRICT OF MASSACHUSETTS, } *ss:*
City of Boston, }

William G. Harris, the above-named defendant, being duly sworn, deposes and says that he has read the foregoing answer and knows the contents thereof, and that the same are true of his own knowledge, except as to those matters therein stated on information and belief, and as to those matters he believes it to be true.

WILLIAM G. HARRIS.

Sworn to before me this third day of November, 1873. Witness my hand and notarial seal.

[SEAL.] ELISHA BASSETT,
Notary Public.

271 *Replication. Filed Dec.* 10, 1873.

This repliant, saving and reserving to itself all and all manner of advantage of exception to the manifold insufficiencies of the said answer, for replication thereunto says that he will aver and prove the said bill to be true, certain, and sufficient in the law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by this repliant; without this, that any other matter or thing whatsoever in the said answer contained, material or effectual in law to be replied unto, confessed and avoided, traversed or denied, is true. All which matters and things this repliant is and will be ready to aver and prove as this honorable court shall direct, and humbly prays as in and by its said bill it has prayed.

——— ———

By J. E. MAYNADIER,
Its Solicitor.

272 *Amendments to Answer. Filed by Consent as of March* 26, 1874.

Insert on page 5—printed record, page 6—immediately after the paragraph referring to the letters patent No. 44624, granted to Stewart Hartshorn October 11, 1864, and reissued August 27th, 1867, No. 2756, as follows: And also in letters patent of the United States No. 62235, granted to L. A. Tripp and C. H. Horton February 19, 1867, for improved curtain-fixtures.

Also insert on page 6—printed record, page 8—immediately after the names of persons mentioned to have had knowledge of the invention described in the letters patent granted to Jacob David Sept. 24, 1867, prior to the alleged invention thereof by said David, as follows:

To William Campbell, residing at Brooklyn, N. Y., and doing business at No. — Centre street, in the city of New York, and who had knowledge of the same at said city of New York.

To John P. Wild, of No. 45 Elliot street, Boston, and who had knowledge of the same at said Boston.

To Andrew and Marcus L. de Voursney, doing business at No. 389 Broome street, New York city, New York, and who had knowledge of the same at said city of New York.

To James W. James, residing at 60 Suffolk street, in the city of New York, and who had knowledge of the same at said city of New York.

Also insert in page 7—printed record, page 8—after the paragraph referring to the letters patent No. 68502, granted to Stewart Hartshorn Sept. 3, 1867, and reissued Sept. 2, 1873, No. 5558, as follows:

In the English letters patent No. 2416 of 1854, granted to David Davies.

In the English letters patent No. 12375 of 1848, granted to Edward Smith.

In letters patent of the United States granted to William Campbell Sept. 24, 1857, and being No. 69176, dated Sept. 24, 1867.

In letters patent of the United States No. 12271, granted to Dexter H. Chamberlain and John Hartshorn January 23, 1855, for "improvements in curtain-fixtures."

In letters patent of the United States No. 18536, granted to John W. Currier and James M. Thompson Nov. 3rd, 1857, for "improvements in curtain-fixtures."

In the specification and drawings in the application for letters patent of the United States for a curtain-fixture filed July 10, 1855, by Edwin P. Monroe.

And also was found and contained in the curtain-rollers well known as coach-fixtures or rollers, and which were in common use long prior to the alleged invention of said David.

Also on pages 4 and 6—printed record, pages 6, 7, and 8—for William Brown read "William Henry Brown," and for Frank Trask read "Francis W. Trask."

S. D. LAW,
Solicitor for Defendant and of Counsel.

273 *Deposition of William Campbell.*

MAY 13, 1870.

Direct examination by S. D. LAW, Esq., of counsel for defendant:

Int. 1. What is your name, age, residence, and occupation?

Ans. William Campbell; forty-two years of age; I reside in Brooklyn, N. Y.; I do business at No. 87 Centre street, N. Y. city; I am a spring shade-roller manufacturer.

Int. 2. Are you the same person to whom the "letters patent No. 69176" were granted on September 24th, 1867?

Ans. Yes.

Int. 3. Please state when you made and completed the invention described in that patent.

Ans. For a certainty, as early as the first of May, 1867.

Int. 4. State what fact, if any, leads you to mention that date—May 1st, 1867—as being a time as to which you can speak with certainty in connection with that invention, and having made it by that date.

Ans. An Englishman in my employ I showed it to, and he being with me a few months before then—the reason why I can verify this fact is that he made the remark of what a great time our first of May was here—in relation to a good many people moving—changing their residence; it was a new thing to him.

Int. 5. State whether, according to your best recollection, you had completed the invention patented to you September, 1867, about or just before the first of May, or some time previous thereto; and if so, about how long before the first of May, as near as you can state.

Objected to as leading by complainant's counsel.

Ans. To the best of my recollection, about three months before the first of May, 1867.

May 1, 1867.

Cross-examination by Mr. Maynadier:

Cross-int. 6. Prior, had you been engaged in the manufacture of spring shade-rollers, or shade-rollers of any kind?

Ans. Yes, sir.

Cross-int. 7. For how long, and what kind of shade-rollers had you manufactured?

Ans. For nine years; spring-rollers of various kinds, such as old-style ratchet-rollers, called the English fixture, plain spring-rollers of skylights, without any ratchets; also wedge-rollers, the wedge acting like a pawl, binding between the roller and the bracket.

Cross-int. 8. By the old-style ratchet, or English fixture, do you mean rollers with the spring-spindle passing clear through them, like the roller now shown you, marked "Exhibit Old Coach," etc.?

Ans. That is one of the old styles that I have made, but I have also made rollers like it—except that the spindle did not go clear through—called extension-rollers.

274 Cross-int. 9. These extension-rollers could be lengthened or shortened by a contrivance near the end of the roller, which could be slidden upon the other part of the roller. Is this so?

Ans. That is about so.

Cross-int. 10. Did they have two springs, or only one?

Ans. Only one.

Cross-int. 11. Were they patented, so far as you know?

Ans. No.

Cross-int. 11. Were you familiar during the nine years preceding May 1st, 1867, with styles of spring-rollers in the market?

Ans. Yes.

Cross-int. 13. Did you, during that time, know of any rollers which had wooden cylinders bored out at the end like those now shown you, marked "Exhibits Nos. 2, 9, and 4?"

Objected to as new matter.

Ans. I have seen wooden rollers. I don't know that they were bored out in this way.

Cross-int. 14. About when was it, as near as you can state, that those spring-rollers of wood, bored out at one end to receive the spring and spring-spindle, came into the market?

Same objection.

Ans. I must explain here a little, before I go any further, about this boring-out arrangement. The wooden roller that I have reference to was made in two half circles and glued together. A Boston fixture, I believe. None of them were used in this city that I am aware of. This was a hollow cylinder all through. I could not say when this was; it was a good many years ago. It was five or six years before I made my invention; might have been more, and might have been less. I cannot state any positive time as to when these rollers like "Exhibits 2, 3, and 4" first came into the market.

Cross-int. 15. What kind of rollers do you now make?

Ans. I make self-acting rollers, old-style ratchet-rollers, spool-spring rollers. All our rollers are spring-rollers, plain rollers without pawls, or counterbalanced for skylights. We make them with a pin in to hold the spring in place when the roller is changed or wound up.

Cross-int. 16. What do you mean by self-acting rollers?

Ans. Rollers that don't require any balances or fastening with a cord; will stay in any desired position by working with either a quick or slow motion. They are constructed like "Exhibits 1, 2, 3, and 4."

Cross-int. 17. Have you ever made fixtures in which the pawl did not revolve with the roller, and in which there was no cord to hold the pawl from the ratchet?

Ans. No.

Cross-int. 18. All the pawl and ratchet-fixtures you have ever made either had a cord on the pawl to hold it away from the ratchet or else the pawl revolved with the roller; is not this so?

Ans. Yes.

275 Cross-int. 19. When did you first get fixtures in the market of your manufacture in which the pawl revolved with the roller?

Ans. I can't give the exact date without referring back to my book; some time in 1868.

Cross-int. 20. Were any of these fixtures made with a wooden roller bored out at one end, like "Exhibits Nos. 2, 3, and 4?"

Objected to as irrelevant.

Ans. Those I put in the market in 1868 were made of tin.

Cross-int. 21. When did you first begin to manufacture fixtures in which the pawl revolved with the roller, and in which the rollers were made of wood and bored out at one end?

Same objection.

Ans. I think about four years ago.

Cross-int. 22. Had you ever seen or heard of any spring shade-roller in which the pawl revolved with the roller before you had the invention patented to you in patent No. 69176?

Same objection.

Ans. No.

Cross-int. 23. Why did you make so narrow a claim as is found in that patent?

Same objection.

Ans. How do you construe a narrow claim?

Cross-int. 24. Why did you confine your claim to the loose or sliding pins having heads upon them—in combination with the flattened or notched shaft?

Same objection.

Ans. Because I thought they were entirely new, and did not interfere with any previous patent of Hartshorn's.

Cross-int. 25. Why did you not claim placing the pawl upon the roller so that it would revolve with it?

Same objection.

Ans. Because I didn't think it amounted to anything.

Cross-int. 26. Did you ever see any of Tripp and Boyd's fixtures which came in the market some time in the spring or summer of 1867?

Same objection.

Ans. The year I know nothing about; I have seen the fixtures.

Cross-int. 27. Those fixtures had a pawl in a chamber which revolved with a roller, did they not?

Same objection.

Ans. Yes.

Cross-int. 28. Do you recollect whether they were in the market before you got any of your fixtures in the market?

Same objection.

Ans. I don't know.

Cross-int. 29. Did those fixtures you made some time in 1868 have sliding pins or bolts with heads upon them like those shown in your patent?

276 Ans. Yes.

Cross-int. 30. How long did you continue to make fixtures with this style of sliding pins or bolts?

Ans. Probably two or three years.

Cross-int. 31. And after that did you make pivoted pawls?

Ans. Pivoted and not pivoted; both pivoted and sliding, and still make both kinds.

Adjourned.

MAY 4TH, 1874.

Redirect examination:

Int. 32. Had you ever know of or seen any self-acting rollers, such as you speak of in your cross-examination, prior to the self-acting rollers put into the market by Mr. Stewart Hartshorn?

Objected to as immaterial.

Ans. No.

Int. 33. You say that you first began to manufacture the fixtures having the roller of wood and bored out at one end about four years ago. State, if you can, in what year you began to make such fixtures.

Ans. In 1869.

WM. CAMPBELL.

Attest: JOHN A. SHIELDS, *Examiner*.

277 D. *Decree.*

U. S. Circuit Court, District of Massachusetts.

SALEM SHADE ROLLER MANUF. CO. *vs.* WILLIAM G. HARRIS.

DEC. 22, 1875.

Upon consideration of the pleadings and proofs, and after having heard the parties fully, by their respective counsel, it is ordered, adjudged, and decreed as follows:

First. That letters patent number 69189, granted to Jacob David September 24th, 1867, is a good and valid patent, and that the said Jacob David is the original and first inventor of the invention therein described and claimed.

Second. That the complainants are assignees and owners of said letters patent.

Third. That the defendant has infringed the first claim of said letters patent by the sale of curtain-fixtures in which the pawl or detent is moved away from the axis of the roller by centrifugal force and towards that axis by gravity; and has infringed the second claim of said patent by the sale of curtain-fixtures, the rollors of which are of wood, with a chamber formed in one end, and containing the spring for actuating the roller and its rod, the rollers having also a detent; this spring, its rod, and the detent being so arranged as to admit of shortening the roller to fit the window by simply sawing off a portion of it.

Fourth. That the complainant recover of the defendant all gains and profits derived by him from his said use of said inventions respectively, and also in addition thereto the damages sustained
278 by the complainant by reason of such use by the defendant,
and also costs of suit, to be taxed.

Fifth. That this suit be referred to John G. Stetson, Esq., master in chancery, to ascertain and report to the court the gains and profits and to assess the damages above mentioned; and that the complainant is authorized to examine the defendant *ore tenus* or otherwise, and to inspect all books and other vouchers in the premises.

Sixth. That the defendant, his servants, agents, workmen, and attorneys, be enjoined perpetually from making, using, or selling any one or more curtain-fixtures in which the pawl or detent is moved away from the axis of the roller by centrifugal force and towards that axis by gravity, and also any one or more curtain-fixtures, the rollers of which are of wood, having a chamber formed in one end and containing a spring for actuating the roller and the rod of the spring, and having a detent, and in which this spring, its rod, and the detent are so arranged as to admit of shortening the roller to fit the window by simply sawing off a portion of it.

By the court:

JOHN G. STETSON, *Clerk.*

A true copy of the decree entered in the above-entitled cause on the 22d day of December, A. D. 1875.

Attest: [seal.] ALEX. H. TROWBRIDGE,
Deputy Clerk of said Court.

279 At a stated term of the circuit court of the United States of America for the — circuit and — district of New Jersey, held at the city of Trenton, on the 24 day of Sept., 1878.

Present: The Honorable John T. Nixon, D. J.

Stewart Hartshorn *vs.* Daniel Willis & Abel Willis.

This cause having been brought to a final hearing on the bill taken as confessed as to the defendant, Daniel Willis, having been heard on the part of the complainant, and no one appearing on behalf of the defendant, and the same having been duly considered by the court:

Now, at this term of said court, on motion of ——— ———, solicitor for complainant, it is found, and hereby ordered, adjudged, and decreed, that the reissued letters patent No. 2756, 7367, & 7370, granted unto the complainant, being the patents referred to in the complainant's bill, are severally good and valid patents, and that the said complainant was the original and first inventor of the improvements described and claimed in the said patents, reissued, 2756 & 7370, and William Campbell was the original and first inventor of the improvement described and claimed in the reissue No. 7367, and also that the said defendant has infringed upon the said patents, and upon the exclusive rights of the complainant under the same.

And it is further ordered, adjudged, and decreed that the complainant do recover of the defendant the profits, gains, and advantages which the said defendant, Daniel Willis, has received or made, or which have arisen or accrued to him from said infringements of the said patents by the manufacture, use, or sale of the improvement described and secured by the said reissued letters patent Nos. 2756, 7367, & 7370.

And it is further ordered, adjudged, and decreed that the said complainant do recover of the defendant his costs and charges and disbursements in this suit, to be taxed.

And it is further ordered, adjudged, and decreed that it be referred to S. D. Oliphant, one of the masters of this court, residing in the —, to ascertain and take, and state and report to the court an account of the gains, profits, and advantage which the said defendant, Daniel Willis, have received, or which have arisen or accrued to him since the granting of said letters patent, infringing the said exclusive rights of the said complainant by the manufacture, use, and sale of the said improvements patented in said several letters patent.

279½ And it is further ordered, adjudged, and decreed that the complainant, on such accounting, have the right to cause an examination of said defendant, Daniel Willis, *ore tenus* or otherwise, and also the production of the books, vouchers, and documents of said Willis, and that the said defendant attend for such purpose before said master, from time to time, as said master shall direct.

And it is also further ordered, adjudged, and decreed that perpetual injunction be issued in this suit against the said defendant according to the prayer of the bill.

JNO. T. NIXON, *J.*

A true copy.
[SEAL.] S. D. OLIPHANT, *Clerk.*

280 U. S. Circuit Court, East Dist. Mich.

STEWART HARTSHORN
vs.
SAGINAW BARREL CO. and Others.

It is hereby consented and stipulated that the admission of defendants, found on page 4 of the record, folio 16, may be amended by adding thereto at the end thereof the words "and after the dates of the patents sued upon."

It is also consented that the complainant may put in further testimony to prove the construction of the roller sold by the defendants in the suit of "The Salem Shade Roller M'f'g Co. *vs.* William G. Harris," decided in Massachusetts in 1875, and the record in which suit has been put in evidence in this cause.

Dated Dec. 18, 1882.

SPRAGUE & HUNT,
Def'ts' Sol'rs.

(Here follows diagram marked p. 281.)

282 NEW YORK, *November* 1, 1882.

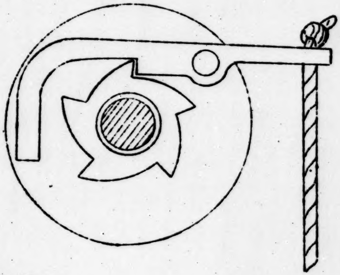
Met pursuant to adjournment.

Present: Counsel as before.

Complainant's counsel having yesterday learned of certain changes and alterations in the testimony of defendants' expert witness, William E. Hagan, made by the said witness in his testimony after his examination and after his testimony had been closed, and which

Hartshorne v. Saginaw Barrel Co. et. al.
Complts, Exh Drawing of Pawls & Ratchets
Oct 25 1882
S. N. W. Exr.

Fig A.



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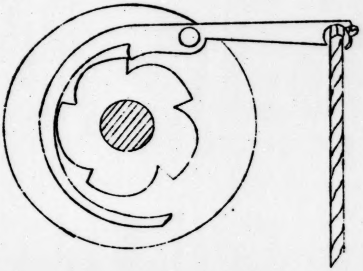


Fig B.

S. Hartshorn

Curtain Fixtures

No. 68.502. Patented Sept. 3 1867

Fig 2

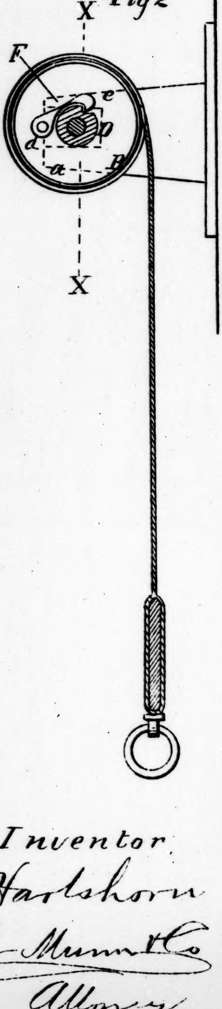
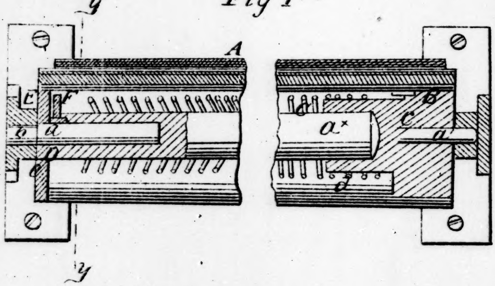


Fig 1



No. 310.
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vs.
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} p. 284

Inventor.
S. Hartshorn
Per Munn & Co
Attorney

Witnesses
Theo Tusche
J. A. Fraser

alterations appear in the testimony of said witness, as signed by him, objects to the following alterations and amendments in the testimony of said witness:

Alteration in answer 16, page 21, of defendants' printed record as altered.

Alteration in answer 19, page 25, line 3 of answer.

Alteration in answer 20, at page 27, in line 27.

Alteration in same answer at page 28, in line 21.

Alteration in answer 24, at page 31, in line 6.

Alteration in answer 27, at page 34, in line 4.

Alteration in answer to cross-question, 21, at page 42, in line 4 of the answer.

Addition to answer to cross-question 24, on page 43.

Alteration in answer to cross-question 25, page 43, in lines 1 and 4 of the answer.

Addition to answer to cross-question 27, on page 43 of the record.

Alteration in and addition to answer to cross-question 31, at pages 44 and 45 of the record.

Alteration in the answer to cross-question 76, at page 57 of the record.

As changing the sense of the said several answers as originally given by the witness on his examination; and complainant's counsel gives notice that he shall on the hearing move the court that these alterations and changes be stricken out, and that the answers of the said witness stand as originally given.

283 And complainant's counsel here formally requests and insists that the testimony of said witness, as written out by the stenographer from notes taken on the examination of said witness, be filed with the court.

(Here follows diagram marked p. 284.)

285 DEFENDANTS' EXHIBIT HARTSHORN ORIGINAL PATENT. H. S. SPRAGUE, *Notary Public.*

UNITED STATES PATENT OFFICE.

STEWART HARTSHORN, of New York, N. Y.

Improved Shade-Fixture.

Specification forming part of letters patent No. 68502, dated September 3, 1867.

To all whom it may concern:

Be it known that I, Stewart Hartshorn, of county and State of New York, have invented a new and improved shade-fixture, and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings forming part of this specification.

This invention relates to a new [and] useful improvement in that class of shade-fixtures in which the shade-roller is provided with a spiral spring for automatically winding up the shade. The present invention is an improvement on a shade-fixture of this class, for which letters patent were granted to me, bearing date October 11, 1864, and is designed to obviate an objection attending the original device, which consists in the unwinding of the spring whenever the shade-roller is removed from its brackets or bearings, a contingency which involves the necessity of winding up the spring previous to the replacing of the roller in its bearings and which cannot be done by an unskilled person without considerable difficulty.

In the accompanying sheet of drawings figure 1 is a longitudinal central section of my invention taken in the line X X, Fig. 2; Fig. 2 a transverse section of the same taken in the line Y Y, Fig. 1.

Similar letters of refererence indicate corresponding parts.

A represents a window-shade and B the roller to which it is attached, the roller having a spiral spring, C, fitted within it and arranged in such a manner that it will have, when not restrained, a tendency to roll up the shade.

The spring attachment to the roller is the same as shown and described in my original letters patent.

The roller B is provided with journals, A A′, to one of which, A, a hub, D, is keyed, said hub having a notch, B, made in it, as shown clearly in Fig. 2; the journal A of the roller has a square or two flat sides at its outer end, as shown at B, to fit into a bracket, E, attached to the window-frame, and this journal A does not turn with the roller, but the other journal, A, is fitted firmly in a head, C, in the roller, to which head the case of the roller—a metallic tube, D—is attached, the journal A, or extension A thereof, being fitted loosely in the head C, so that the roller may turn without the journal A, as will be fully understood by reference to Fig. 1. The end of the case or tube D of the roller has a disk, E, secured in
286 it, and this disk, as the roller B rotates, turns loosely on the fixed journal A.

This disk E has a pawl, F, attached to its inner side, shown more particularly in Fig. 2, and this pawl, when engaged with the notch B in hub D, retains or holds the roller B, so that it cannot turn under the influence of the spring C and roll up the shade A. The spring, when fitted in the case D, is attached, one end to the head C and the other end to the fixed journal A, or to its extension A, and the spring is wound up by pulling down the shade B; consequently, when the shade is fully down, the spring will have a tendency to wind it up.

The pawl F engages itself with and disengages itself from the notched hub D automatically.

In order to insure the pawl engaging itself with the hub the upward motion of the shade is checked, for, by having the disk E rotate slowly, the pawl will drop into the notch B of the hub, but when the said disk is allowed to rotate rather quickly the pawl will pass over the notch B, not having time to drop into it; hence, the shade may be retained at any desired height without any difficulty whatever, precisely as in the original invention previously patented.

The difference, however, between the within-described arrange-

S. Hartshorn,

Shade Fixture,

No. 2,756, Reissued Aug. 27, 1867.

Fig: 1

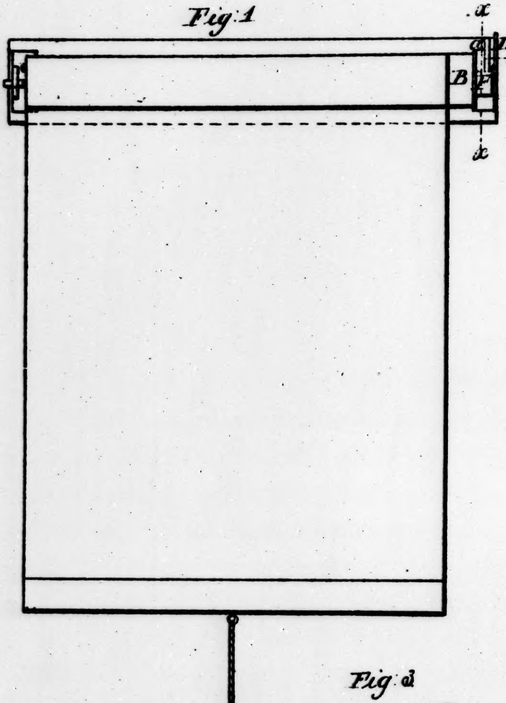

Fig: 2

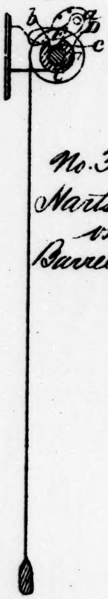

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Fig: 3

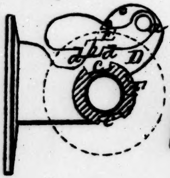


Fig 4.

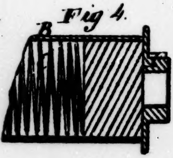
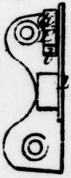


Fig: 5.



Witnesses;
M. M. Livingston
C. L. Topliff

Inventor;
Stewart Hartshorn

ment and that of the original invention is essential in the original plan. The spring C unwinds immediately as soon as the roller is removed from its bracket or bearings, as the pawl, instead of being attached to the roller or any part connected therewith, is attached to the bracket, the notched hub being attached to the journal of the roller, and when the notched hub is removed from the pawl the spring immediately unwinds.

In my present improvement, the pawl and notched hub being both connected with the roller, the spring is retained or prevented from unwinding equally as well when the roller is removed from its brackets or bearings as when adjusted in them.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

The attaching of a pawl and a ratchet or notched hub to a window-shade roller, provided with a spring, or to parts connected with said roller, in such a manner that the tension of the spring will, without any manipulation of adjustment of parts whatever, always be preserved, whether the roller be fitted in the brackets or bearings or removed therefrom, substantially as set forth.

STEWART HARTSHORN.

Witnesses:
ALEX. F. ROBERTS.
J. M. COVINGTON.

(Here follows diagram marked p. 287.)

288 Defendants' Exhibit Hartshorn's First Patent. H. S. Sprague, *Notary Public.*

United States Patent Office.

Stewart Hartshorn, of New York, N. Y.

Improvement in Shade-Fixtures.

Specification forming part of letters patent No. 44624, dated October 11, 1864; reissue No. 2756, dated August 27, 1867.

To all whom it may concern:

Be it known that I, S. Hartshorn, of the city, county, and State of New York, have invented a new and improved shade-fixture; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a front view of my invention applied to a window-shade; Fig. 2, a transverse section of the same, taken in the line *x x*; Fig. 3, an enlarged view of Fig. 2, showing a different position of the pawl; Fig. 4, a longitudinal central section of a portion of the shade-roller; Fig. 5, an enlarged detached front view of the bracket and pawl pertaining to the invention.

Similar letters of reference indicate like parts.

This invention relates to an improvement in that class of shade-fixtures in which the shade-roller is provided with a spiral spring for the purpose of automatically winding up the shade.

The invention consists in the application of a pawl and ratchet *ratchet* or notched hub arranged in such a manner that the shade may be stopped and retained at any desired height or point within the scope of its movement by a simple manipulation of the shade, as hereinafter fully shown and described, the usual cord for operating or turning the shade-roller being dispensed with entirely, as well as counterpoises, which have in some instances been employed in connection with spring-rollers for holding the shade at any desired point.

A represents a window-shade, and B its roller, the latter having a spiral spring, C, fitted within it, and arranged in such a manner that it will have a tendency to turn the roller B and wind up the shade. The spring C is shown in Fig. 4. This feature, however, of a spring within a shade-roller for the purpose of winding or rolling up the shade is not new. To one of the brackets D, in which the shade-roller B is hung, there is attached by a pivot, A, a pawl, E, said pivot passing through one end of the pawl, so that its opposite end will have a tendency to drop, by its own gravity, on a hub, F, attached concentrically to a plate, G, which is secured to one end of the roller B. (See Figs. 2 and 3.) The pawl E is provided with a projection, B, which, when the pawl drops, engages with either of two
notches, C C, in the hub F, and holds the roller B, prevent-
289 ing the shade from being wound upon it. The projection is
made rather oblique or inclined at one side D, so as to admit of being forced out of a notch, C, when the shade is pulled down. The other side, D, of the projection B is made at right angles with the bottom of the pawl, so as to catch firmly against the front edges of the notches and prevent the spring C from forcing the projection B out therefrom and winding up the shade. By pulling down the shade, however, so that the projection B of the pawl will be forced out of the notch, C, it is fitted in, and then allowing the spring C to turn the roller B briskly back, the projection B will slip over the notches, or the latter pass under the former, without catching, and the shade may be wound up to the desired height by the spring, the projection B of pawl E catching into a notch as soon as the motion of the roller is checked.

I would remark that, if desired, the pawl E may be placed underneath or at one side of the hub F, instead of over it, as represented, and a spring be made to bear against it in order that its projection B may engage with the notches C C. I prefer, however, the former method.

Having thus described my invention, I claim as new and desire to secure my letters patent—

The application to a shade-roller, provided with a spiral spring for automatically raising and rolling up the shade, of a pawl and a ratchet or notched hub so arranged that the former will engage with the latter at any point or height of the shade by simply check-

W. Campbell,

Window Shade Fixtures,

No. 69,176, Patented Sept. 24, 1867.

Fig. 1.

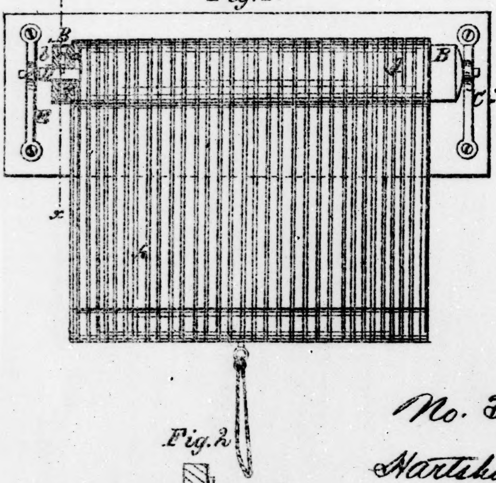
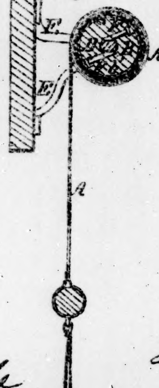


Fig. 2



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} p. 290.

Witnesses
Theo Tusch
J. Alban Fraser

Inventor
Wm Campbell
Per Munn & Co
Attorneys

ing the rotation of the roller and the upward movement of the shade under the influence of the spring, substantially as set forth.

STEWART HARTSHORN.

Witnesses:

ALEX. F. ROBERTS.
J. M. COVINGTON.

(Here follows diagram marked p. 290.)

291 DEFENDANTS' EXHIBIT CAMPBELL PATENT. H. S. SPRAGUE, *Notary Public.*

UNITED STATES PATENT OFFICE.

WILLIAM CAMPBELL, of New York, N. Y.

Letters Patent No. 69176, dated September 24, 1867.

Improved Window-Shade Fixture.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, William Campbell, of the city, county, and State of New York, have invented a new and useful improvement in window-shade fixtures; and I do hereby declare that the following is a full, clear, and exact description of the same, which will enable others skilled in the art to make and use my invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a front view of my improved window-shade, part being broken away to show the construction.

Figure 3 is a detail sectional view of the same taken through the line x x, Fig. 1.

My invention has for its object to furnish an improved device by means of which the spring-roller of a window-shade may be made to hold the shade stationary at any desired elevation and yet allow the same to be drawn down or run up, without obstruction or stoppage, as far as may be desired; and it consists in the combination of the loose or sliding pins or bolts having heads formed upon them with the flattened shaft of the roller, as hereinafter more fully described.

A is the window-shade. B is the hollow roller, one end of which is pivoted to the bracket C and the other end of which revolves upon the shaft D, that carries the coiled spring, and the projecting end of which is secured in the jaws of the bracket E, so that by drawing down the shade A, and thus revolving the roller B, the coiled spring may be wound closer around the shaft D. In the block or part of the roller B that closes or forms the end of the said hollow roller B, and forms its bearing upon the shaft D, are formed two holes leading, upon opposite sides, from its outer or convex surface to a little at one side of its centre, as shown in Fig. 2. The outer end of the said hollow

roller B *and* forms its bearing upon the shaft D, — are formed two holes, leading upon opposite sides. The outer ends of these holes are countersunk, as shown. The two opposite sides of the shaft D within the block or part B are flattened or notched, as shown in Fig. 2. F are two pins or bolts the bodies of which fit into the holes in the
block B and their heads fit into the countersunk parts of said
292 holes. The bolts or pins F are of such a length that when
their heads rest against the case or shell of the roller B their points may be free from the shaft D, and when their heads rest upon the bottom of the countersunk part of the said holes their inner ends or points may overlay the flattened sides of the shaft D, so as to bind said shaft and prevent its revolution. Whenever the shaft D is drawn or allowed to run up with a little rapidity the centrifugal force engendered by the revolution of the roller B projects the pins F outward, so that their heads rest against the case or shell of the roller B, leaving the block B′ free to revolve upon the shaft D, but when the motion of the roller B is checked the pin F that happens to be uppermost drops down, so that its point or forward end rests upon the shaft D, and as soon as the said point reaches the flattened side of said shaft it drops down a little further, so as to overlap the said flattened side of the said shaft and hold it securely in place.

Having thus described my invention, I claim as new and desire to secure by letters patent—

The combination of the loose or sliding pins or bolt F, having heads formed upon them, with the flattened or notched shaft D, substantially as herein shown and described and for the purpose set forth.

The above specification of my invention signed by me this 14th day of August, 1867.

WM. CAMPBELL.

Witnesses:
WM. F. McNAMARA.
JAMES T. GRAHAM.

(Here follows diagram marked p. 293.)

294 DEFENDANTS' EXHIBIT SMITH'S ENGLISH PATENT. H. S. SPRAGUE, *Notary Public*.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the bound volumes of the library of this office of the specification and drawing in the matter of the English letters patent granted Edward Smith December 16, 1848, No. 12375.

In testimony whereof I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be affixed this second day of May, in the year of our Lord one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and sixth.

[SEAL.]

E. M. MARBLE,
Commissioner.

295 A. D. 1848. No. 12375.

Window-blinds and Springs for Window-blinds, Doors, &c.

Smith's Specification.

To all to whom these presents shall come I, Edward Smith, of Kentish Town, in the county of Middlesex, window-blind manufacturer, send Greeting:

Whereas Her Present Most Excellent Majesty Queen Victoria, by her royal letters patent under the great seal of the United Kingdom of Great Britain and Ireland, bearing date at Westminster the sixteenth day of December, one thousand eight hundred and forty-eight, in the twelfth year of her reign, did, for herself, her heirs and successors, give and grant unto me, the said Edward Smith, my ex'ors, adm'ors, and assigns, her especial license, full power, sole privilege, and authority that I, the said Edward Smith, my ex'ors, adm'ors, and assigns, or such others as I, the said Edward Smith, my ex'ors, adm'ors, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend within England, Wales, and the town of Berkwick-upon-Tweed my invention of "improvement in window-blinds and in springs applicable to window-blinds, doors, and other like purposes," in which said letters patent is contained a proviso that I, the said Edward Smith, shall cause a particular description of the nature of my said invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, to be enrolled in her said majesty's high court of chancery within six calendar months next and immediately after the date of the said in part recited letters patent, as in and by the same reference being thereunto had will more fully and at large appear:

Now know ye that, in compliance with the said proviso, I, the said Edward Smith, hereby declare that the nature of the invention and in what manner the same is to be performed are fully ascertained and described in and by the present specification thereof, reference being had to the drawings hereunto annexed; that is to say:

My invention, in so far as it regards "window-blinds," has reference to what are called roller-blinds, and consists in certain improved modes or means of raising and lowering such blinds, however such blinds may be constructed in other respects; and my improvements in springs "applicable to window-blinds, doors, and other like purposes" consist in the application thereto of a description of springs commonly called torsion-springs, never hitherto used for this purpose, though possessing, probably, greater power than springs of any other sort to effect the quick raising or lowering of blinds, or the quick opening or shutting of doors, or the quick change of position of any other matters or things similar in their construction and uses—such, for example, as curtains, screens, roller maps and plans &c.

My improved modes or means of raising or lowering roller window-blinds are two in number:

The first consists in dispensing with the spring ordinarily used to press the pawl on the ratchet-wheel which controls the action of the roller. I effect this by weighting the short or inner end of the pawl as shewn in figure 1 of the annexed drawings, so that 296 when it is desired to cause the pawl to catch into the teeth of the ratchet it is only necessary to relieve it of part of the weight of the cord and tassel by holding it up by the hand. The operation is thus perfectly noiseless.

The second improvement under this head of my invention consists in a more convenient method of pulling the endless cords, by which the blinds are raised and lowered. The details of this method are exhibited in figure 2. A is the roller; B, an internal toothed grooved pulley affixed to one end of the roller. C is the bracket; D, an endless wire or other cord, which takes into the grooved pulley at top, and at bottom runs upon a spring or common rack-pulley, E. F is a tasseled cord, which is affixed to the buckle joining the ends of the cord. The advantages gained by this arrangement are that a much smaller pulley can be used on the end of the roller, and the hand in pulling up the blind has therefore to move through a much less space than is the case where a large pulley is employed. The tasseled cord besides is much more convenient to lay hold of than when the endless cord alone is employed.

With respect to the torsion-springs, which constitute the other branch of my invention, I desire it may be understood that I prefer in all cases making the said torsion-springs of vulcanized India rubber, as being a more permanently elastic material than any other with which I am acquainted, and much less liable to get out of order, but that they may be made also of strips of metal, or of metal wire, or of whalebone, or of catgut, and of various other substances more or less elastic or pliable; and I do not therefore restrict myself to the employment of any particular substance in the construction of the said spring.

In figures 3, 4, and 5, of the annexed drawings I have shewn how much torsion-springs may be applied to a window-roller blind. Figure 3 is an external elevation of the roller; figure 4, a longitudinal section of figure 3, and figure 5 a cross-section on a line, *a b*, of figures 3 and 4. A is the roller, which is composed of two parts, A1 and A2. A1 is a solid cylinder of wood, or it may be of any other suitable material, and A2 a metal tube, which is affixed to one end of A, which is recessed at that end for its reception, so that both parts of the roller may be externally in one straight line. C is a wooden plug with metal cap, C A, which is inserted into the outer end of the tubular part A2. D is a ratchet-wheel, which is affixed to the outside of the cap C A; E, a box which contains the spring and short arm of the pawl or detent F, Fig. 5A, and is fitted upon the ratchet-wheel by means of a fixed spindle, D A, which passes through the centre of the ratchet-wheel, and also through the cap C A and plug C, and extends a little way beyond the latter into the interior of the tube A2. The spindle D A projects at its out through the box E, and terminates in a square piece which fits into a corresponding aperture in the bearing bracket G1, neither the box nor spindle being intended in any case to revolve. C B is a cap attached to the outer end of the part A1 of the roller, and has a short round spindle, D B, which takes into a circular hole in the bracket G2.

The axes, therefore, upon which the roller revolves are the 297 spindler D A at one end, when the ratchet-wheel is released from the pawl, and the spindle D B at the other, only that in the former case the roller turns round the axis, while in the latter the roller and axis revolve together. H is the torsion-spring, which consists of a thick strip of vulcanized India rubber enclosed within the tubular piece A2. At one end this spring is made fast to a block or plug inserted into the inner end of the tube and at the other end to the fixed spindle D A of the click-box E. When the roller is pulled round and the blind drawn down—an operation to which the click F offers no resistance—the revolution of the roller causes necessarily a twisting or torsion of the strap of vulcanized India rubber, because one end only—the inner end—revolves with the roller, while the other—that attached to the spindle D A—is fixed. The moment, however, the click F is released the powerful tendency which the torsion-spring has to return to its original position comes into full play and causes the roller to revolve in the contrary direction, and thereby raises the blind.

Figures 6, 7, and 8 shew different forms which may be given to the vulcanized rubber torsion-spring. In figure 6 it is square in its cross-section, and looped at the two ends, to afford an easy means of attaching it. In figure 7 two stands or cords are employed, and in figure 8, which is a cross-section of the spring, a hollow tube or pipe is used.

In figure 9 I have shewn how the torsion-spring may be applied to doors. A is part of the door; B, the door-post; C, the spring-box or tube containing the piece of vulcanized India rubber, partially twisted to give it greater power. The India rubber is affixed at bottom to the end of the tube, with which it revolves, and at top to the fixed spindle D, by which it is held stationary. E is an arm which projects from the spring-box and presses against the door. When the door is opened the arm E causes the spring-box to be turned around and the India rubber inside of it to receive a still further twist. The India rubber occupies the place and fulfills all the duties of the coiled steel spring generally employed in back springs for doors.

Figure 10 exemplies the application of a torsion-spring to a double-acting spring—that is, to a spring for closing a door either outwards or inwards. A is the door; B, the spring-box, partly in section; C, a pin, which is stepped in the plate D, which is affixed to the floor. E is a bearing which rests upon the top of the pin C, and upon which it reposes as a center on which the door may turn. This bearing forms the upper end of the spring-box. F is a collar which is affixed to the pin C, and, like it, cannot turn round. G G are two thick strips of vulcanized India rubber, which are securely attached to the bearing E at top and to the collar F at bottom.

When the door is either pushed outwards or inwards the India rubber springs are thereby twisted more or less, each on its own axis, and the moment the door is relieved from pressure the natural tendency of the springs to resume their normal position causes the door to close. To increase the power of the spring they may be partially twisted previous to being fixed in their places, the one to the right hand and the other to the left, as represented in the drawings. 298 From the preceding exemplifications it will be readily seen how torsion-springs may be applied to all purposes like to the raising or lowering of blinds or opening or shutting of doors, no other modifications being in any case necessary than such as any competent workman will be able to supply.

And having now described the nature of my said invention, and in what manner the same is to be performed, I declare that the improvements which I claim as constituting my said invention are as follows:

First. I claim the employment in roller window-blinds of pawls, weighted at one end, whereby the springs ordinarily used are dispensed with, as before described.

Second. I claim the employment in roller window-blinds of a supplementary end cord, attached to the usual endless cord, for the purpose of more conveniently raising and lowering the same.

Third. I claim the application of torsion-springs to window-blinds and doors, as before exemplified, and to all other like purposes.

In witness whereof I, the said Edward Smith, have hereunto set my hand and seal this sixteenth day of June, one thousand eight hundred and forty-nine.

EDWARD SMITH. [L. S.]

And be it remembered that on the sixteenth day of June, in the year of our Lord 1849, the aforesaid Edward Smith came before our said lady, the queen, in her chancery, and acknowledged the specification aforesaid, and all and every thing therein contained and specified, in form above written, and also the specification aforesaid was stamped, according to the tenor of the statute made for that purpose.

Enrolled the sixteenth day of June, in the year of our Lord one thousand eight hundred and forty-nine.

Ex'd: H. M. H. E. A. M.

(Here follows diagram marked p. 299.)

300 DEFENDANTS' EXHIBIT DAVIES ENGLISH PATENT. H. S. SPRAGUE, *Notary Public.*

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the bound volumes of the library of this office of the specification and draw-

A.D 1854 NOV. 15. N°2416
DAVIES' SPECIFICATION

FIG. 1.

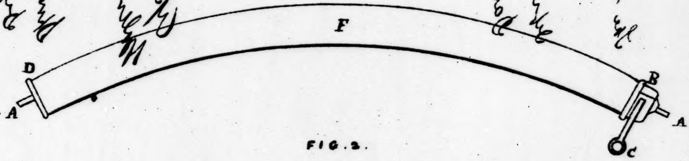


FIG. 2.

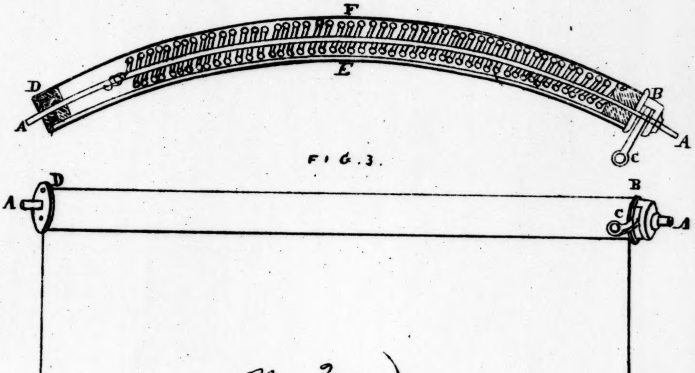
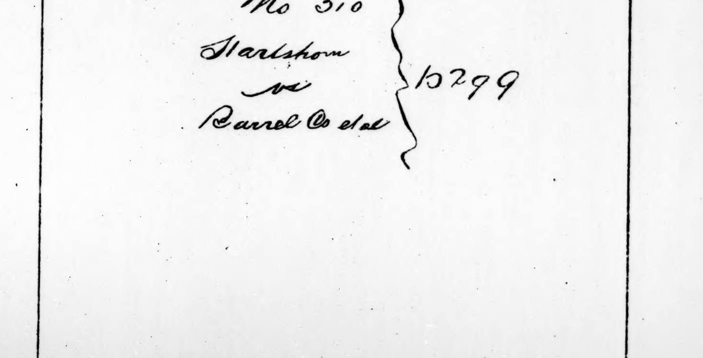


FIG. 3.



No 310
Hartshorn
vs
Barrel Co et al
15299

ing in the matter of the English letters patent granted David Davies November 15, 1854, No. 2416, for improvement in roller-blinds.

In testimony whereof I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be affixed this thirteenth day of May, in the year of our Lord one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and sixth.

[SEAL.] E. M. MARBLE,
Commissioner.

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301 *Specification Forming Part of English Patent No.* 2416, *Dated November* 15*th*, 1854.

DAVID DAVIES.

Specification in pursuance of the conditions of the letters patent filed by the said David Davies in the Great Seal Patent Office on the 15th May, 1855.

To all to whom these presents shall come, I, David Davies, of Wigmore street, Cavendish square, in the county of Middlesex, coachmaker, send Greeting:

Whereas Her Most Excellent Majesty Queen Victoria, by her letters patent, bearing date the fifteenth day of November, in the year of our Lord one thousand eight hundred and fifty-four, in the eighteenth year of her reign, did, for herself, her heirs and successors, give and grant unto me, the said David Davies, her special license that I, the said David Davies, my executors, administrators, and assigns, or such others as I, the said David Davies, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, invention for "an improvement in roller-blinds" upon the condition, amongst others, that I, the said David Davies, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said letters patent.

Now know ye that I, the said David Davis, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof—that is to say:

This improvement consists in making roller-blinds, curvilinear in form, so as to be applicable to the circular windows of houses, carriages, et cetera. For this purpose I provide a fixed rod or axle of the required curve, upon which I place the spring for rolling up the blind and cover it with an elastic flexible covering, instead of the tin barrel heretofore used in straight roller-blinds. Upon the elastic barrel I affix the blind, its lower edge being stretched upon a rod of the same curve as the axle.

And in order that the nature of this my improvement may be more fully understood, reference is had to the drawings hereunto annexed, and to the letters and figures marked thereon—that is to say:

Figure 1 is a plan vew of a curvilinear blind-roller constructed agreeably to my improvement. Figure 2 is a sectional view of the same, and figure 3 an elevation of the roller with the blind attached thereto. A is the rod or axle, bent to the same curve as the window or other opening to which the blind is to be applied, each end of the axle being firmly secured in a frame or bracket. B is a pulley with the usual pawl or ratchet and the trigger or detent C. D is an end pulley running free upon the axle A. E is a coiled wire spring, one end of which is fastened to the pulley B, the other end to
302 the axle A. F is an elastic tube or covering of caoutchouc or other suitable material, the ends of which are attached to the end pulleys B and D. The blind is then fastened round the flexible covering tube of the roller F by stitching, and a metal stretcher of the same curve as the roller is introduced at its lower edge, G. The yielding of the elastic covering tube F permits the blind to roll and unroll in the same curve as the rod or axle A with as much facility as straight spring roller-blinds have hitherto done. And I desire it to be distinctly understood that the new and peculiar feature of my said improvement in roller-blinds consists in the employment of a flexible elastic covering tube in place of rigid metal tube, which encloses the spring of an ordinary straight roller-blind.

Having now described the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim as new and constituting my invention of an improvement in roller-blinds is—

The application to the windows of houses, carriages, or other places of curvilinear spring roller-blinds constructed and arranged as hereinbefore described, and shown in the accompanying drawings.

In witness whereof I, the said David Davies, have hereunto set my hand and seal this eleventh day of May, in the year of our Lord one thousand eight hundred and fifty-five.

DAVID DAVIES. [L. S.]

Ex'd: H. M. H. E. A. M.

Witness:
W. BADDELEY.

303 THE UNITED STATES OF AMERICA, } *ss:*
Eastern District of Michigan, }

I, Walter S. Harsha, clerk of the circuit court of the United States for the eastern district of Michigan, do hereby certify and return to the claim of appeal filed in said court, in the case of Stewart Hartshorn against the Saginaw Barrel Company and others, that the above and foregoing are true copies of all papers filed and proceedings had and entered in said cause as appears of record in my office; that I have compared the same with the originals, and they are true and correct transcripts therefrom and of the whole thereof.

In testimony whereof I have hereunto set my hand and affixed the seal of said court at Detroit, in said district, this eighteenth day of July, in the year one thousand eight hundred and eighty-three, and of the Independence of the United States of America the one hundred and eighth.

[Seal of the Circuit Court, Eastern District of Michigan.]

WALTER S. HARSHA, *Clerk.*

Endorsed on cover: E. Michigan C. C. U. S. No. 310. Stewart Hartshorn, appellant, *vs.* The Saginaw Barrel Company, A. W. Wright, A. A. Brockway, and Reuben Kimball. Filed 29th September, 1883.

119-664

U. S. Supreme Court.

STEWART HARTSHORN,
Appellant,
vs.
THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY AND REUBEN KIMBALL,
Appellees.

BRIEF AND ARGUMENT ON THE PART OF THE APPELLANT.

S. D. & J. T. LAW, Esqs.,
Solicitors for Appellant.

S. D. LAW,
Of Counsel.

SPRAGUE & HUNT, Esqs.,
Solicitors for Appellees.

U. S. Supreme Court,

OCTOBER TERM, 1886.

No. 66.

Stewart Hartshorn,
Appellant,

vs.

The Saginaw Barrel Company,
A. W. Wright, A. A. Brockway
and Reuben Kimball,
Appellees.

Brief and Argument on the part of the Appellant.

This is an appeal from a decree of the Circuit Court of the United States for the Sixth Circuit, in the Eastern District of Michigan, made by the Hon. John Baxter, Circuit Judge, on the 10th day of April, 1883, dismissing the Bill of Complaint with costs to the defendants.

The *decree* is set forth in the Record, at page 29, and the *appeal* at pages 127 to 129.

Statement of the Case.

To assist this Court in more readily understanding the questions coming before it on this appeal, and the bearing and force of the testimony introduced in the cause, I shall aim to make the "*Statement of the Case*" so much in detail as to set forth not only the various issues raised by the pleadings, but also the general character of the testimony introduced, making full references therein to the Record, without however reading therefrom. A more full "Statement of the Case" than is usually made, is also deemed advisable for the reason that the facts and circumstances connected with the Reissues involved in this appeal, are of a peculiar and unusual character, and are such as have never been, in any case, before this Court for consideration and decision.

Nature of Suit.

The suit in the court below was brought for an alleged infringement of three several Letters Patent for "*Improvements in Shade Rollers*," as follows :

1. *Reissued Patent, No. 7,370, dated October 31, 1876*, granted to the complainant ; called the HARTSHORN REISSUE.

2. *Reissue Patent, No. 7,367, dated October 31, 1876*, granted to the complainant as assignee of William Campbell ; called the CAMPBELL REISSUE.

3. *Patent No. 69,189, dated September 24, 1867*, granted to Jacob David, and assigned to the complainant ; called the DAVID PATENT.

These several Patents are printed in the Record, pp. 11 to 18 inc.

Pleadings in the Cause.

THE BILL OF COMPLAINT ALLEGED:

1. The grant of Letters Patent, *Nos. 68,502*, to the complainant, *on the 3d day of September, 1867;* the surrender of said patent, and the grant of the Reissue thereof, *No. 7,370*, on the 31st day of October, 1876. (*Rec., p. 23.*)

2. The grant of Letters Patent, *No. 69,176*, to William Campbell, *on the 24th day of September, 1867;* the assignment of said patent to the complainant on the 13th day of February, 1874; the surrender of said patent, and the grant to the complainant of the Reissue thereof, *No. 7,367*, on the 31st day of October, 1876. (*Rec., p. 3–4.*)

3. The bringing of suits by the complainant upon said Reissue *Nos. 7,367 and 7,370*, in the Circuit Court of the United States for the District of New Jersey, against Melville A. Fraser and against Daniel Willis, in which decrees were entered, sustaining said patents; and, in the Circuit Court of the United States for the Southern District of New York, against Charles Moss, in which was also entered a decree and various orders sustaining said Patents. (*Rec., p. 5–6.*)

4. The grant of Letters Patent, *No. 69,189*, to Jacob David, *on the 24th day of September, 1867;* and the assignment of said patent to the Salem Shade Roller Co., a corporation of Massachusetts, in the year 1873. (*Rec., p. 6–7.*)

The bringing of a suit under said patent by the said *Salem Shade Roller Co.* against one *William G. Harris*, in Massachusetts, in 1873; the hearing of said cause on pleadings and proofs, and a decree therein by the Court at Final Hearing, in 1875, sustaining said patent, and finding infringement thereof by said Harris (a copy of which decree is set forth in the Record, pp. 18, 19). (*Rec., p. 7, 8, 18.*)

And the assignment of said David Patent to the complainant, in June, 1881. (*Rec., p. 8.*)

5. That the complainant was the legal owner and holder of said Patents, *Nos. 7,370, 7,367 and 69,189*, and that the inventions described therein were of great value to him and to the public. (*Rec., p, 5-8.*)

6. Charged the manufacture and sale by the defendants of shade rollers and fixtures containing and employing the inventions described and patented in said Reissues *No. 7,367* and *No. 7,370*, and in said Patent *No. 69,189*, granted to said David; notification to said defendants of such infringement (*Rec., p. 8-9*), and

7. Prayed for an injunction and account against the said defendants. (*Rec., p. 10.*)

THE ANSWER OF DEFENDANTS

1. Denied, on information and belief, all the allegations of the Bill as to the issue to complainant of his *Patent No. 68,502*, and alleged that the surrender thereof was not for sufficient cause, and that the *Reissue No. 7,370* was not for the same invention described in the original patents, and was invalid. (*Rec., p. 21, 22, I. to V.*)

2. Denied, on information and belief, all allegations as to the issue to said Campbell of his *Patent No. 69,176*, and the assignment thereof to the complainant, and alleged that the surrender thereof was not for sufficient cause, and that the *Reissue No. 7,367* was not for the same invention described in the original patent, and was invalid. (*Rec., p. 22, 23, VI. to IX.*)

3. Alleged that the *Reissues 7,367 and 7,370* were fraudulently obtained, with the intention to deceive the public, and of depriving subsequent inventors and patentees of their rights by enlarging the scope of the claims of the said Reissues to embrace inventions not known to the inventors at the date of their original applications. (*Rec., p. 23, X.*)

4. Denied, on information and belief, that the complainant was the owner of said *Reissues No. 7,367 and 7,370*. (*Rec., p. 23, XI.*)

5. Denied, on information and belief, that suits were brought under said Reissues, in the District of New Jersey and in the Southern District of New York, as set forth in the bill of complaint, and alleged that said suits were collusive. (*Rec., p. 23, 24, XII., XIII.*)

6. Denied, on information and belief, all allegations as to the issue to said David of his Patent No. 69,189, on the 24th day of September, 1867;

The assignment of said patent to the Salem Shade Roller Company;

The bringing of a suit under said patent by said company against said Harris in 1873, in the District of Massachusetts, and the rendering of a decree therein sustaining said patent, and ordering an injunction to issue against said Harris, and alleging that said decree was fraudulent and collusive; and also denying, on like information and belief,

The assignment of said David Patent to the complainant. (*Rec., p. 24, 25, XIV. to XIX.*)

7. Denied that the defendants had made, used or sold shade fixtures embodying the inventions patented in the said Hartshorn and Campbell Reissues, and in said David Patent, or either of them. (*Rec., p. 25, XX.*)

8. Denied that the said Hartshorn, Campbell and David were the first and original inventors of the inventions described in said Patents No. 7,370, No. 7,367 and No. 69,189;

And alleged that said several inventions, or material and substantial parts thereof, were shown and described in various patents mentioned in said answer (*Rec., p. 25, 26, XXL.*), among which were the following:

Letters Patent No. 44,624, granted to the complainant Oct. 11, 1864; and the Reissue thereof, No. 2,756, granted Aug. 27, 1867;

Letters Patent No. 68,502, granted to the complainant Sept. 3, 1867;

Letters Patent No. 69,176, granted to William Campbell Sept. 24, 1867;

English Letters Patent No. 12,375, of 1848, granted to William Smith ; and

English Letters Patent No. 24,161, of 1854, granted to David Davies.

(The above were put in evidence by the defendants.)

8. Alleged that the defendants were manufacturing and selling shade fixtures made under Letters Patent No. 208,417, No. 225,857 and No. 251,275 granted to W. B. Noyes in 1878, 1880 and 1881. (*Rec., p. 26, XXII.*)

9. And denied that the complainants were entitled to relief of any kind in the premises. (*Rec., p. 26 XXIV.*)

REPLICATION

in the prescribed form was duly filed by the complainant to the answer of the defendants. (*Rec., p. 28.*)

Complainant's Title.

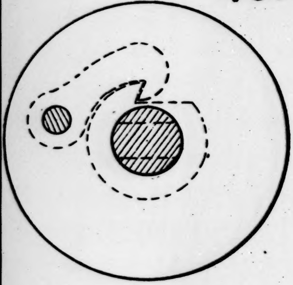
The *Hartshorn & Campbell Reissues No. 7,370 and No. 7,367* were granted directly to the complainant.

The *David Patent, No 69,189* became vested by mesne assignments, in the complainant.

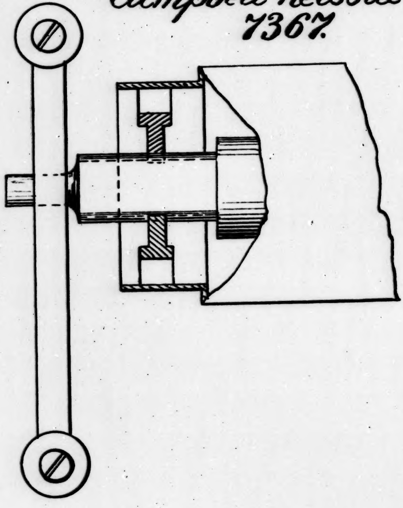
Copies of those assignments were put in evidence (Rec., p. 33) ; and are printed in full in the Record, on pages 146 to 152.

No testimony was put in by the defendants disputing complainant's title.

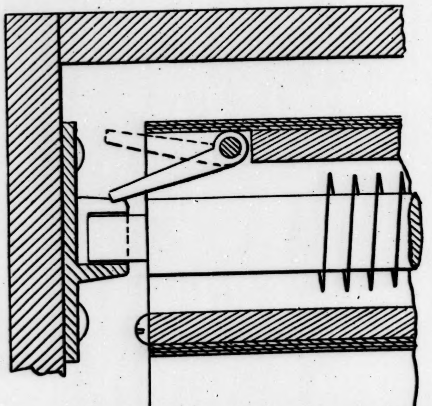
artshorn Reissue
7370.



Campbell Reissue
7367.



David Patent 69189.



Infringement.

The claims of the several patents alleged to have been infringed by the defendants are as follows :

The claim of the *Hartshorn Reissues*, *No. 7,370.*

> "In a spring shade roller having a pawl or detent and ratchet, or their equivalent, constructed and arranged so as to engage automatically for holding the shade at any desired point or height, the combination with a ratchet, or its equivalent upon the stationary spindle or stationary part of the fixture, of a hinged or pivoted pawl, placed upon the end of the roller, and acting substantially at right angles to the ratchet or notched hub."

The first Claim of the *Campbell Reissue*, *No. 7,367.*

> "1. In a spring shade roller, having a pawl or detent and ratchet, or their equivalent, so arranged as to allow the shade to be drawn down or run up without obstruction, and which engage automatically with each other to hold the shade in any desired position ; the arrangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that when the roller is removed from its brackets the tension of the spring will be preserved."

The two Claims of the *David Patent*, *No. 69,189.*

> "1. The arm or detent k, arranged upon the roller in such a manner that it moves toward and away from the centre or axis of the roller by the action of gravity and centrifugal force, substantially as described.
>
> 2. The combination and arrangement at the same end of a shade roller, of the spring *e*, rod *d*, and arm or detent k, or their mechanical equivalents, substantially as described."

(The roller described in the David Patent was a solid wooden roller, bored out at one end, to receive the spring, and having its arm or detent that engaged with the bracket at the same end with the spring, the other end of the roller being left so that it could be sawed off, and the roller thus easily made to fit any window.)

The preceeding diagrams show upon a somewhat enlarged scale, the construction and arrangement of the pawls and ratchets described and shown in these several patents.

The rollers, which were made and sold by the defendants, previous to the commencement of this suit, and after the dates of the patents sued upon, as admitted on the record (*Rec., p. 33 and 170*), are shown by the Exhibit Rollers, marked "*Complainant's Exhibits, Saginaw Barrel Co.'s Rollers, No. 1 and No. 2*"*;* the two exhibits being the same in construction, except that in one of the exhibits only a single pawl is used, while in the other exhibits there are two pawls.

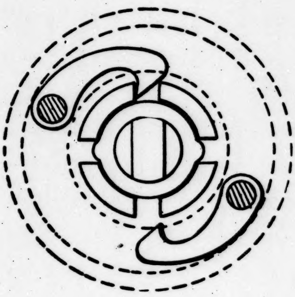
The accompanying diagram shows the construction and arrangement of pawl and ratchet, used in the defendant's rollers.

Testimony was put in on the part of the complainant, to prove that the rollers made and sold by the defendant, contained and employed the inventions described and claimed in

The Hartshorn Reissue, No. 7,370 (Rec., pp. 35-38).
The Campbell Reissue, No. 7,367 (Rec., pp. 38-40), and
The David Patent, No. 69189 (Rec., pp. 40-41).

This testimony was not directly questioned or contradicted by the defendants; but evidence was put in by them to the effect that the patents in suit, if valid, were to be limited, in view of prior pat-

Saginaw Barrel Co's Roller.



ents, to the particular devices described and shown therein; and that when so construed and limited defendant's rollers did not infringe any of said patents.

Testimony as to prior Adjudications upon the Patents Indorsed.

a. HARTSHORN & CAMPBELL REISSUES, NOS. 7,370 AND 7,367.

Testimony was put in by the complainant (*Rec., p. 32*) to show that final decrees and orders for injunction and attachment had been granted by the U. S. Circuit Courts in New Jersey and in the Southern District of New York, upon the Hartshorn & Campbell Reissues, and this testimony is set forth in the Record on pages 99, 100, 101-152, 153-155, 156 and 169, 170.

These decrees were entered, however, by default, and not upon final hearing on pleadings and proofs; but the orders for injunction and attachment were made upon vigorously contested motions, and after hearing counsel for the defendant, and were submitted as being to a certain degree of as high authority as decisions upon pleadings and proofs.

b. THE DAVID PATENT, NO. 69,189.

The complainant put in evidence (*Rec., p. 32*) a copy of a record upon final hearing on pleadings and proofs, in a suit brought upon this patent by "*The Salem Shade Roller Manufacturing Co.* v. *Harris*," tried in the U. S. Circuit Court for the District of Mass., decided in 1875, and a copy of the decree entered in the same cause in December, 1875, sustaining the David Patent.

The Record, so far as printed, is set forth on pages 157 to 168 of the Record.

Testimony was also put in by the complainant to show that the shade roller sold by the defendant *Harris*, and which was held by the Court, in the said suit of the *Salem Shade Roller Manufacturing Company* v. *Harris*, to be an infringement of the David Patent, No. 69,189, was substantially the same in construction as the shade rollers made and sold by the defendants (appellees) in this suit.

The Harris Roller is shown by the rollers marked "S. S. M. Co. *v.* Harris, Complainant's Exhibits No. 2 and No. 3."

The annexed diagrams show the construction of the defendants' roller and of the Harris roller, and the form and position of the pawls and ratchets therein.

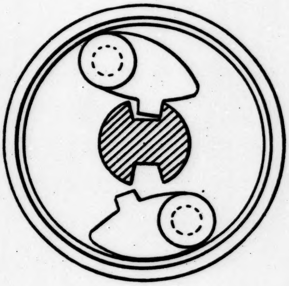
No evidence was offered by the defendants in the present suit, questioning or contradicting the testimony of the complainant as to the previous litigations upon his patents, or as to the construction of the Harris roller.

Validity of Reissued Patents.

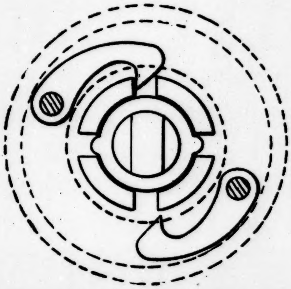
The Reissues appearing to have been granted about nine years after the grant of their originals: To show that these Reissues did not come within the rule or principles expressed in *Miller* v. *Brass Co.*, 104 U. S., 350, and in subsequent cases; and that there had been no "unreasonable delay" in applying for and securing such Reissues; and that such Reissues were good and valid Patents, testimony was put in by the complainant to the following effect:

(*a*) That the complainant, Hartshorn, *on the 2d day of August, 1867*, filed an application for a Patent for an Improvement in Shade Rollers, on which there was granted to him, *on the 3d day of*

Harris Roller.



Saginaw Barrel Co., Roller



September, 1867, Letters Patent No. *68,502*, in which there was granted to him a broad and generic claim as follows (see Patent No. 68,502):

> "The attaching of a pawl and a ratchet, or notched hub to a window shade roller provided with a spring, or to parts connected with said roller, in such a manner that the tension of the spring will, without any manipulation or adjustment of parts whatever, always be preserved, whether the roller be fitted in the brackets or bearings, or removed therefrom, substantially as set forth;"

and being substantially the same claim as is now claimed in the Campbell Reissue No. 7,367.

(*b*) That a short time after, *on the 14th day of August, 1867*, Campbell filed an application for a Patent for an Improvement in Shade Rollers, in which the invention, like that of Hartshorn, had the pawl and ratchet both connected with the roller, and would permit the roller to be removed from its brackets without unwinding the spring, but differed in form and arrangement from that of Hartshorn, and that Campbell, on his said application, had granted to him *on the 24th day of September, 1867*, Letters Patent No. 69,176; the claim in his Patent being confined to the peculiar form of pawl and ratchet shown and described by him (see Patent No. 69,176).

Campbell's application was filed *15 days after* that of Hartshorn, and his Patent granted *21 days after* Hartshorn's.

The applications of Hartshorn and Campbell were both prepared and filed by the same attorneys—Munn & Co., of New York city (*Rec., p. 141, 171*).

Hartshorn's application being first, in point of time, a broad, generic claim, covering broadly the invention set forth in his specification, and such as he supposed he was entitled to make, was inserted in his application; but in Campbell's application, made a few days later, the claim was limited to the particular form of pawl and ratchet described by him.

No interference was declared by the Patent Office between the two applications, but both were passed with the claims as made therein.

(*c*) That in preparing for trial the suit of *The Salem Shade Roller Manufacturing Co.* vs. *Harris*, before mentioned, commenced in Massachusetts in 1873 and decided in 1875, and taking testimony therein, it was established that Campbell—though a *later patentee* than Hartshorn—was the *prior inventor* over Hartshorn of the invention described and shown in his (Hartshorn's) patent No. 68,502; *Campbell's* invention being fixed "as early as the first of May, 1867 (*Rec., pp. 164-5, Int. 3-5*), while Hartshorn's invention was made only a few days before the time he filed his application August 2d, 1867 (*Rec., p. 95-6 Hartshorn's testimony Cr. Int. 15-17*).

(*d*) That this testimony of Campbell, that he was a prior inventor to Hartshorn, of such a construction and arrangement of pawl and ratchet, engaging automatically for holding the shade, as would prevent the spring unwinding when the roller was removed from the brackets, as had been claimed by Hartshorn in his patent No. 68,502, made evident that Hartshorn's said patent of 1867 (No. 68,502) improperly contained, and could not be sustained with the broad claim existing therein; that such broad claim could only be sustained when made a part of Campbell's patent; and that Hartshorn was legally entitled to only a claim for his specific construction and arrangement of pawl and ratchet. These defects, or rather *mistakes in fact*, thus discovered to exist in these patents, could be corrected only by way of Reissue.

(*g*) That applications for reissues of said patents were made by the complainant (who had become the legal owner of the Campbell patent) in May, 1875, within a "reasonable time,"—much less than two years—after the defects in said patents were discovered and established by the testimony of Campbell; and that upon such applications the reissues in suit were granted (Patents: Rec., pp. 11 and 13).

The broad claim originally contained in the Hartshorn patent of 1867, No. 86,502, being transferred to and incorporated into the *Campbell Reissue, No. 7,367;*—and the claim in the *Hartshorn Reissue. No. 7,370*, being limited to the particular device of pawl and ratchet, invented by him.

None of the testimony put in by the complainant, in relation to said patents and their reissues, was controverted or questioned by the defendants.

Defense to Suit.

The testimony put in by the defendants was principally to establish:

That in an English patent, granted in 1848 to Edward Smith, there was described and shown a spring shade roller, having a pawl and ratchet so constructed, to quote the language of defendant's expert, that "when the curtain was moved rapidly, the pawl would overrun the ratchet so as not to engage with it, but when moved slowly the pawl would drop into the notched hub, engage with it, and stop the revolution of the roller," and that "as thus constructed the roller could be taken from its brackets and removed therefrom without unrolling the roller or disturbing the parts in the least" (*Rec., p. 106, Int. 17*).

That in view of the said Smith Patent, and of the first Hartshorn Patent of 1864, and the original Campbell Patent, No. 69,174, there was no invention in what is described in the Hartshorn Reissue, No. 7,370 (*Rec.*, *p. 108*, *Int. 20*).

And that in view of the said Smith English Patent, and the older Hartshorn Patent of 1864, the inventions of Campbell and David must be confined to the particular device or construction of pawl and ratchet, shown and described in those patents (*Rec.*, *p. 109*, *Int. 21*, *22*) :

And that under such construction of those patents, the rollers made and sold by the defendants did not infringe such patents (*Rec.*, *p.* 111, 112, *Int. 27*, *28* and *29*).

The testimony of the expert of defendants also endeavored to show that the Campbell Reissue was broader than its original, for the reason that the parts shown and described in the original patent, which engaged with the flattened or notched spindle, and called "sliding bolts or pins," were not *pawls or detents*, under the proper meaning of such words ; that in the reissue the engaging parts were described as *pawls or detents ;* thus claim was "for a shade roller having a *pawl or detent* and a ratchet."

And that "the claim of the reissue had added to it something which did not occur in the claim of the original patent, was not mentioned or illustrated in it, the interpolation or addition being a *pawl or ratchet*" (*Rec.*, *p. 100*, *Int. 24*).

Defendants' Exhibits.

The defendants put in evidence (*Rec., p. 101, 102*):

Hartshorn Patent, No. 68,502, of Sept. 3, 1867; the Original Patent of the Reissue No. 7,370, now in suit;

Hartshorn Patent, No. 2,756, of Aug. 27, 1867; the Reissue of the Hartshorn Patent of October 11, 1864;

Campbell Patent, No. 69,176, of Sept. 24, 1867; the Original Patent of the Reissue No. 7,367, now in suit;

English Patent, No. 12,375, of Dec. 16, 1848, granted to Edward Smith; and

English Patent, No. 2,416, of Nov. 15, 1854, granted to David Davis.

And also *Certified Copies of the Models* in the U. S. Patent Office, in the

Hartshorn Patent of 1864, No. 44,624;
Hartshorn Patent of 1867, No. 68,502;
Campbell Patent of 1867, No. 69,176; and
David Patent of 1867, No. 69,189. (*Rec, p. 113.*)

And *a Model* claimed to be made in accordance with specification and drawing of the

Smith English Patent of 1848. (*Rec., p. 102*)

Rebutting Testimony.

The complainant's rebutting testimony was chiefly directed to prove that the Smith English Patent of 1848 did not describe or show, as alleged by defendants, a shade roller with a pawl and ratchet so constructed that, when the curtain was moved rapidly, the pawl would overrun the ratchet so as not to engage with it, but when moved slowly the pawl would drop into the notched hub, and stop the revolution of the roller;

That the construction of that Patent as given by the expert of defendants was radically incorrect and could not be sustained from any proper construction and interpretation of the language contained therein,

And, that the pretended Model of such Smith Roller, introduced by the defendant, did not truly represent or illustrate the construction and operation of the fixture described in said Smith Patent;

And, that said Smith Patent did not, when properly construed, in any way anticipate complainant's Patents, or limit the claims contained therein.

Hearing and Decision.

The cause came on for hearing, on pleadings and proofs, before Mr. Justice Baxter, at Detroit, on the 9th day of April, 1883, and was decided by him, on the hearing; the bill of complaint being dismissed, with costs to the defendants.

No written decision was given or filed by the learned justice, but in his oral opinion he held that both of the Reissued Patents in suit were invalid, and that the David Patent was not infringed by the Roller made and sold by the defendants.

The foregoing "statement of the Case" having set forth so fully, and as we believe correctly, the general condition of the cause in the Court below, extended argument on many points will be unnecessary; the attention of the Court will, therefore, be more particulary called to those questions which are considered most important.

In the preceding statement the patents in suit have been referred to *in the order of the dates of their first issue*; we will hereafter consider them *in the order of the times of invention* of the improvements described therein, so as to present to the Court the several inventions as they followed each other, and as they take their place in respect to the history of the art.

The several patents in suit, when arranged according to *the times of invention* of the improvements described therein, stand in the following order:

I. THE DAVID INVENTION: PATENT NO. 69,189.
Invention made in December, 1866.
(*David's tes., Rec., p. 78, Int. 4.*)
(Patent applied for August 8, 1867 (*Rec., p. 146*).
Patent granted September 24, 1867.)

II. THE CAMPBELL INVENTION: PATENT 7,367.
Invention made as early as May 1, 1867.
(*Campbell's tes., Rec., p., 78, Int., 3-5*)
(Patent applied for August 14, 1867 (*Rec., p. 141*).
Patent granted September 24, 1867.)

III. The Hartshorn Invention: Patent, 7,370.
Invention made a few days before August 2, 1867.
(*Hartshorn's tes., Rec., p. 96; Rec., p. 17.*)
(Patent applied for August 2, 1867 (*Rec., p. 96*).
Patent granted September 3, 1867.

The David Patent, though *last applied for* and *last granted*, takes position *prior* to those of Campbell and Hartshorn;

The Campbell Patent, though applied for and granted *after* that to Hartshorn, takes rank *before* it; and

The Hartshorn Patent, though *applied for and granted before* either David's or Campbell's, takes position *after* both of them.

The principal questions for examination and determination in the case are:

I. What are the distinguishing characteristics of the inventions covered by the patents in suit, and alleged to be infringed by the defendants?

II. What is the construction and operation of the defendant's roller; and does that roller contain and make use of the inventions covered by complainant's patents; and

III. Are complainant's patents good and valid patents?

I. What are the distinguishing features of the inventions covered by the patents in suit?

The inventions described in all the several patents in suit, are, as appears from the patents themselves, or from the testimony in the case, *Improvements* upon a Shade Roller, patented to the complainant, Hartshorn, in 1864, and known as the *Automatic or Self-Acting Shade Roller*. It will therefore be necessary to refer to and set forth somewhat particularly the distinguishing features and characteristics of Hartshorn's invention of 1864, so as to better understand the nature and character of the improvements thereon, patented by David, Campbell & Hartshorn in 1867, and set forth in the patents in suit.

1st. The Hartshorn Invention of 1864.

The Automatic Pawl and Ratchet.

This invention produced and introduced into use a new kind or class of Shade Roller, known as the "*Self Acting*" or "*Automatic Shade Roller*"—that is, a Shade Fixture or Roller having and using an *Automatic Pawl and Rachet*, or a pawl so constructed and arranged with respect to the ratchet, that the pawl would be caused to engage with the ratchet, to stop and hold the shade at any desired height or point, or would be prevented from engaging with the ratchet, *by merely varying the speed of the revolution of the roller*, which is effected through the simple manipulation of the shade alone by the hand of the operator; the *pawl engaging* with the ratchet, when the roller is *revolved slowly*, and *not engaging* when the roller is allowed to *revolve quickly*.

This Automatic Pawl and Ratchet is shown in the Reissue, No. 2,756, put in evidence by both parties in this suit, and printed in the Record, on pages 132-3 and 173-4, and is also illustrated in the accompanying diagram.

It is no exaggeration to say that this invention created a complete revolution in spring shade fixtures. The invention has been literally universally adopted.

Previous to that invention, the shade fixtures in use had been generally of three kinds:

1st. Those in which the curtain or shade was raised by means of an endless cord passing over a pulley fixed to one end of the roller, and around another pulley fixed to the lower part of the window casing; these had no spring in the roller to carry up the shade.

"Exhibit Reissue, 2,756."
Kittle's test'y, Record, p. 36.

2d. Spring shade rollers, but without pawls and ratchets, in which the shade was carried up by a spring, and which had a weight, or counterpoise in the lower end of the shade—sometimes in the tassel—to equal or counterbalance the force of the spring;

Exhibit Reissue, 2,756.
Kittle's test'y, Record, p. 36.

3d. Spring shade rollers, having a pawl and ratchet to hold the shade at any desired position or height, in which the pawl was kept in contact with the ratchet by means of a spring, effecting a positive or certain engagement of the pawl with the ratchet, and in which the curtain could be raised only by lifting the pawl out of the ratchet by power applied to the projecting end of the pawl.

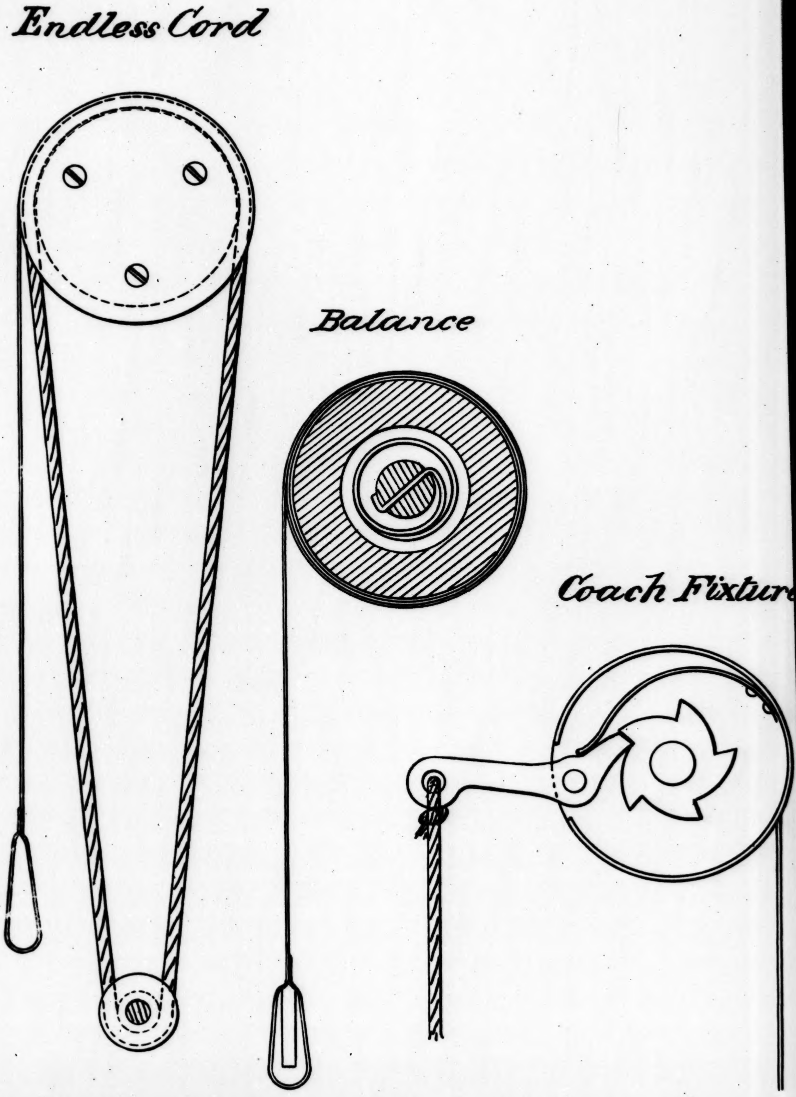
In this kind of roller it was necessary, while one hand of the operator lifted the pawl from the ratchet, to hold the shade with the other hand, or else the shade would quickly fly up for its whole extent.

Kittle, Record, p. 36.

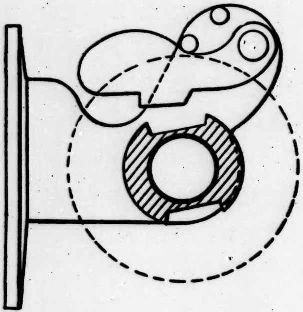
The shade fixture, commonly known as the Coach Fixture, is an illustration of this latter kind.

These several kinds of fixtures are illustrated by the accompanying diagrams.

Hartshorn, by his *Automatic-acting Pawl and Ratchet*, dispensed entirely with cords for operating the roller and counterpoises, and with the old


Endless Cord
Balance
Coach Fixtur

Hartshorn Reissue
2756.



spring pawl and ratchet, which required the use of both hands in manipulating the roller to control the shade in its ascent under the force of the spring; and by its use the shade could be raised or lowered by the manipulation of the shade alone in the hands of the operator.

Exhibit Reissue, 2,756.
Record, Kittle, p. 36.
Renwick, fols. 199, 200.

The particular construction or arrangement of Automatic Pawl and Ratchet invented by Hartshorn and shown in his patent of 1864, and in the "Reissue 2,756," consisted of a *ratchet or notched hub on the end of the roller* and revolving with it, and *a pawl* placed *upon the bracket* or stationary part of the fixture and dropping into the ratchet or notched hub by gravity.

The pawl or detent being mounted on a different part of the fixture from that on which the ratchet was mounted, the latter being on the revolving roller, and the former being on the stationary part, or bracket, it was a necessary result from such construction, when the roller, as a whole, was removed out of its bearings, that there would be a disconnection and disengagement of the engaging parts—the pawl and ratchet—and the spring would uncoil or run down, necessitating a winding up of the spring before the roller was again replaced in its bearings, which was a difficult thing to be done, particularly by those using the fixture.

Hartshorn Reissue, 2,756.

It was also inherent in the arrangement of pawl and ratchet, used in this roller, (the pawl being stationary and resting on the upper side of the revolving notched hub, or ratchet,) as the roller and its notched hub or ratchet revolved under the stationary pawl, that there would be more or less noise in its operation caused by the notched hub striking against and throwing up the pawl.

This invention of Hartshorn—*the Automatic-acting Pawl and Ratchet*—has been before the United States Circuit Courts in New York and Massachusetts in the following suits:

> *Hartshorn* v. *Tripp & Boyd*, 7 Blatchf., 120.
> *Hartshorn* v. *Alney et al.*, 1 Holmes, 493; 8 Off. Gaz., 89.
> *Hartshorn* v. *Shorey*, 9 Off. Gaz., 545,

in all of which it was held by those Courts, in reference to the question of infringement, that this Hartshorn invention was not confined or limited to the specific pawl and ratchet, described and shown in it, but covered any form and arrangement of pawls and ratchets operating substantially in the same manner. The pawls and ratchets in the rollers made and sold by the defendants in all of said suits, differed in form and arrangement from those shown and described in the Hartshorn patent

These suits were all upon the "Re-issue 2,756," and were previous to the decision of this Court in *Miller* v. *Brass Company*, and the validity of the reissue was not brought in issue.

2ND. THE DAVID INVENTION, PATENT 69,189.

Invention made December, 1866.

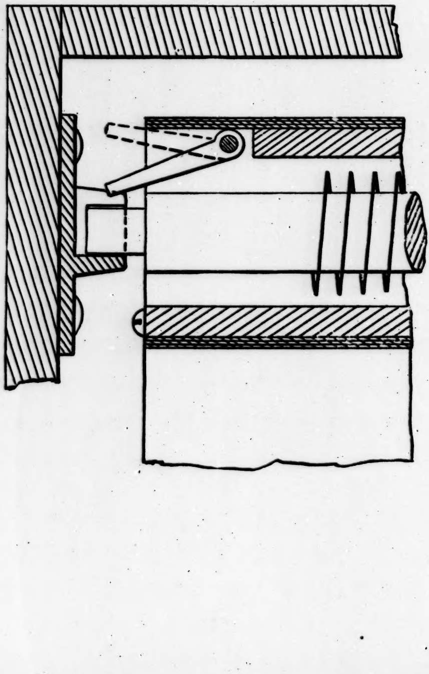
(*Rec.*, *p.* 78, *David's tes.*, *Int.* 5.)

David's invention had for its object to do away with the noise produced in the Hartshorn roller by the contact of the pawl with the ratchet.

David says in his testimony (*Rec.*, *p.* 78, *Int.* 5):

> "The trouble with the Hartshorn roller which we were using at that time, by the noise of the pawl made, in manipulating the shade up and down, was an annoyance to me and our cus-

David Patent
69189.



> tomers, and incited me to invent something that would do away with the noise."
>
> David gave a new form to the pawl and ratchet used, and also shifted the ratchet from the roller and made it a part of bracket, which was a stationary part of the fixture, and applied the pawl or engaging part to the revolving roller.
>
> David's pawl was an "arm or detent" hinged or pivoted in a radial slot in the roller, and arranged in the plane of the axis of the roller—the free end of the arm projecting beyond the end of the roller—so that as the roller revolved rapidly the free end of the pawl or arm would be carried away from the axis of the roller by centrifugal force.

The operation of the David fixture is thus described in his patent:

"The movement of the end of the arm or detent is toward and away from the axis of the roller, centrifugal action (when the roller is rapidly turned) sending the detent outward, at which time it will pass over the elevated side *j* of the journal box *f*. When the roller is moving slowly, or is in a state of rest, the action of gravity brings the detent toward the center of the roller, when the detent is above the center, and at such times said detent engages the said part *j*, and the revolution of the roller is arrested."

The accompanying diagram shows the construction of the David invention.

Pawls of this character, which are carried away from the axis of the roller, when revolving quickly, are called and known as *Flying Pawls*.

David's roller was also a wooden roller, bored out at one end to receive the spring; and he placed at one and the same end of the roller the spring which causes the shade to rise, the stationary spindle to which one end of the spring is attached, and the arm or prawl, whereby he was able to saw off the other end of the roller to fit any width of window.

David Patent, Rec., 16, 17.

David, by his arrangement of pawl or detent, whereby its engaging end was carried away from the axis of the roller, by centrifugal force, so that it would pass over the bracket and ratchet, accomplished his purpose, "to do away with the noise" produced in the Hartshorn roller by the pawl riding upon the revolving notched hub; but

The David Roller having, like the earlier Hartshorn roller, one of the engaging parts—the pawl—on the revolving roller, and the other—the ratchet—on the bracket, when it was removed from its brackets there would be a disconnection of the engaging parts, and the spring would rewind the same as in the earlier Hartshorn Roller.

The claims of the David Patent cover the "flying pawl," and also such construction of roller as permits the end to be sawed off to fit any width of window; they are as follows:

> "1. The arm or detent k, arranged upon the roller in such a manner that it moves toward and away from the centre or axis of the roller by the action of gravity and centrifugal force, substantially as described.
>
> 2. The combination and arrangement at the same end of a shade roller of the spring *e*, rod *d*, and arm or detent k, or their mechanical equivalents, substantially as described."

The David Patent, as alleged in the Bill of Complaint, has been litigated in the Circuit Court of the United States for the District of Massachusetts, in the suit of *The Salem Shade Roller Company* v. *Harris*, which was decided in 1875. That suit was heard upon pleadings and proofs, at final hearing, before the late Mr. Justice Shipley, and upon argument by counsel for the respective parties, and a decree was entered therein in favor of the complainant, sustaining the patent and finding infringement thereof by the defendant.

The Record in said suit, as also the Decree entered therein, have been put in evidence in this cause. *Rec., p. 157 to 169.*)

A copy of said Decree was attached to the Bill of Complaint, and is printed in such connection, at page 18 of the Record.

The Decree made in that case ordered, adjudged and decreed:

"That the Letters Patent No. 69,189, granted to Jacob David, September 24th, 1867, is a good and valid Patent, and that the said Jacob David is the original and first inventor of the invention described and obtained;" and

"That the defendant has *infringed the first claim* of said Letters Patent, by the sale of certain fixtures, in which the pawl or detent is moved away from the axis of the roller by centrifugal force, and towards that axis by gravity; and has *infringed the second claim* of said patent by the sale of curtain fixtures, the rollers of which are of wood, with a chamber formed in one end, and containing the spring for actuating the roller and its rods; the rollers having also a detent, this spring, its rod, and the detent being so arranged as to admit of shortening the roller to fit the window, by simply sawing off a portion of it."

Evidence has also been put in, in this cause, showing what was the construction of the roller sold by the defendant in that suit, and which was held by the Court to be an infringement of said David Patent.

(*Rec., p. 97, 98, Hartshorn's testimony;*
Rec., p. 98, 99, Law's testimony), *and*
Rollers marked "*Exhibits*
Harris Rollers, Nos. 1 and 2."

Those Exhibit Rollers are in fact the identical rollers which were put in evidence in the suit in Massachusetts, as rollers sold by the defendant Harris, and the sale of which was admitted by the said Harris.

The accompanying diagram shows the construction and arrangement of the pawl and ratchet used in the said rollers sold by Harris.

The roller sold by Harris, the defendant in that suit, employed a pawl and ratchet of different construction from those shown in the David Patent, and they were both placed upon or in connection with the roller, but the pawl was so pivoted to the roller that its engaging end was carried away from the axis of the roller, in a quick revolution of the roller, by centrifugal force, but in a slow revolution would drop, by gravity, towards the axis of the roller, and engage with its ratchet to hold the roller.

An indirect attack is, however, made upon the David Patent by the defendants' expert, Dr. Hagan, that it contains a *misstatement of fact* in setting forth that "*centrifugal action or force*" acts, in the rapid revolution of the roller, to send or carry the pawl or detent outward and away from the axis of the roller, and from engagement with the ratchet.

Hagan's Tes., Rec., pp. 116, 117; Cr. Int., 26.

This expert says: "*I very much doubt*" whether "the volocity at which the curtain can be moved" in the roller described in the David Patent "*is sufficient* to throw out the pawls by *centrifugal force.*"

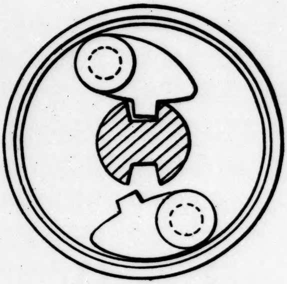
Record, p. 37, Int. 30; p. 113: Cr. Int. 24 to 26.

He admits, however, that the pawl or latch, as he calls in, in the David Patent, "is *thrown outward* by the rapid motion of the roller, so as not to engage with the latch (or ratchet) in the bracket."

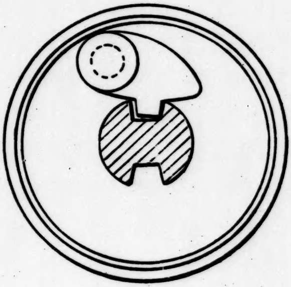
Record, p. 113, Int. 30.

But says this result is produced by "*momentum*," and not by "centrifugal force."

Harris Roller.



Harris Roller.



But whether this force is *called* "centrifugal force," or "momentum"—and *names* are not *things*—it is that force, according to Dr. Hagan's own showing, which is produced by the rapid revolution of the rollers, and which carries the pawl or latch outward and over the catch.

Rec., *p. 116.* *Cr. Int.*, *24*, *25.*

This testimony of the defendants' expert is certainly very remarkable as coming from one who considers himself competent to testify as an expert. He evidently desires to convey the impression, without clearly voicing it, that the David specification and its claim does not truly set forth the invention purporting to be described therein; but he cannot, or dare not, say more than that he "very much *doubts* whether the roller has velocity enough to produce the result" (of throwing out the arm or detent) "by its *centrifugal* force."

The testimony of the complainant's experts, Renwick and Kittle, is, on the other hand, clear and not *doubtingly*, that the force which carries, in the David invention, the arm away from the axis of the roller, and causes it to pass (when the roller is rapidly turned) over the bracket, is "centrifugal force," and that it acts as "centrifugal force" in the David and other rollers in question, to keep the pawl from the ratchet in the rapid revolution of the rollers, and the reasons they give for their opinion far outweigh any "*doubts*" Dr. Hagan may have.

(*Renwick's tes.: Rec.*, *p. 67*, *68*, *Int. 25.*)
(*Kittle's tes.: Rec.*, *p. 90*, *Int. 23.*)

The learned Judge, who presided at the hearing in the suit of *The Salem Shade Roller Co.* v. *Harris*, and who decided that case, seems also to have had no "doubts" as to the presence of "centrifugal force" in the operation of the David roller and its effect upon the pawl in keeping the latter in the rapid revolution of the roller away from the ratchet;

and in finding the same force operative in the same way in the roller sold by the defendant in that suit.

The decision of the Court, in *Salem Shade Roller Manufacturing Company* v. *Harris*, in finding that the Harris roller was an infringement of the David patent, held also, as a necessary consequence, that the David invention was not confined or limited to the particular construction and arrangement of pawl and ratchet, described and shown in the David patent; but covered any form and arrangement of pawl, which moved toward and away from the axis of the roller by gravity and centrifugal force.

Such decision, as to the scope of the invention, is also in entire harmony with the decisions, before referred to, made by different Courts, in the suits brought under the Reissued Patent No. 2,756.

No proof was offered or put in, in the cause, by the defendants to show that any roller was known or used, prior to the David invention, in which the pawl "was arranged upon the roller in such a manner that it moved toward and away from the center or axis of the roller by the action of gravity and centrifugal force."

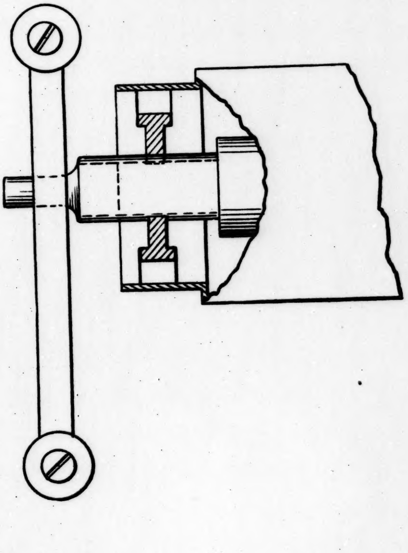
THE CAMPBELL INVENTION: PATENT 7,367.

Invention made as early as May 1st, 1867. (*Rec., p. 165: Int. 3 and 5.*)

Campbell's invention, which followed David's, was a new device or construction and arrangement of pawl and ratchet for holding the shade stationary at any elevation, and allow it to be drawn down or up, without obstruction or stoppage.

Campbell's pawls or detents were attached to, or placed in the revolving roller, as was the pawl in the David roller, but instead of being pivoted thereto,

Campbell Reissue.



were "loose or sliding pins or bolts," as termed in his patent, and these moved in holes or cavities formed in the block, or that part of the roller that formed the end of the hollow tube, and its bearing upon the shaft or spindle. These holes, or cavities, were on opposite sides of the roller, leading from its outer or convex surface to a little at one side of its center. The opposite sides of the shaft or spindle were flattened or notched, and formed the ratchet. When the roller was run up rapidly, the loose pins were projected outward by centrifugal force, and were carried away from the shaft, but when the roller was checked, the uppermost pin would drop down by gravity against the flattened or notched side of the shaft, and hold the roller securely in place.

Campbell's evident wish and intention was to produce a device which would secure the advantages of the Hartshorn invention of 1864, and which, in his opinion, would not interfere with it.

He says:

> "I thought they [the loose or sliding pins] were entirely new, and did not interfere with any previous patent of Hartshorn."

(*Campbell's tes.: Rec., p. 167, Cr. Int. 24.*)

Campbell's pawls—the "loose or sliding pins"—moved toward and away from the center or axis of the roller by the action of gravity and centrifugal force, as did the pivoted arm or detent of the David roller, and they engaged with a stationary part of the fixture, as was also the case in the David roller.

But in the Campbell roller, there was this *new feature of construction*, that the ratchet, or part with which the "loose, sliding pins" or pawls engaged, was placed upon and made a part of the spindle connected with the roller—this spindle being held stationary by its projecting end being secured in the jaws of the bracket.

This placing of the ratchet upon the stationary spindle or non-revolving part of the roller axis, and which was a part of the roller proper, secured a fixed relation of the pawl and ratchet under all circumstances, whether the roller was in or out of its bearings.

In consequence of this construction, the pawl and ratchet would remain in engagement when the roller was taken out of its bearings, and the spring would not run down but would remain wound up.

Campbell Reissue 7,367.
Compts' Record, Kittle, fol. 52.
Compts' Record, Renwick, fol. 216.

The defect or imperfection, existing in the early Hartshorn roller, and, also in the David roller—that the roller could not be removed from its brackets without the spring unwinding—was thus remedied and overcome by the Campbell invention.

The Campbell roller was thus an advance in the art, compared with anything which had preceded it.

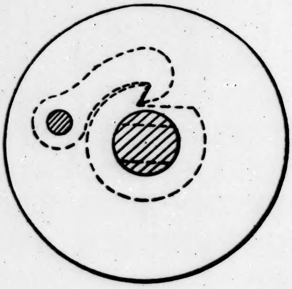
This feature of construction is the subject matter of the first claim of the Campbell Reissue No. 7,367, which is

> In a spring shade roller, having a pawl or detent and ratchet, or their equivalent, so arranged as to allow the shade to be drawn down or run up without obstruction, and which engage automatically with each other to hold the shade in any desired position ; the arrangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that when the roller is removed from its brackets the tension of the spring will be preserved ;

and which is the claim of this patent, which is alleged to have been infringed by the defendants.

Hartshorn Reissue.

7370



THE HARTSHORN INVENTION: PATENT 7,370.

Invention made only a few days before the application for the Patent.

(*Hartshorn's tes.: Rec., p. 96, Int. 15-17*).

The invention of Hartshorn, described and claimed in this patent, is in the arrangement and combination of the pawl and ratchet is substantially the same as in the Campbell roller—that is the pawl is placed upon the revolving roller, and the ratchet upon the fixed spindle, and the pawl moves towards and away from the axis of the roller by gravity and centrifugal force, as in the Campbell roller, engaging by gravity, with the ratchet under a slow revolution of the roller, and being kept from engaging, by centrifugal force, under a rapid revolution of the roller. The pawl and ratchet also have and retain a fixed relation to each other, whether the roller is in its bearings, or removed therefrom, so that the uncoiling of the spring is prevented, as in the Campbell roller, when the roller is removed from its bearings.

The difference between the two rollers is that of specific construction and arrangement—the pawl in this Hartshorn roller being pivoted on the end of the roller, to the inside of a plate or disk attached thereto and revolving with it, and acting substantially at right angles to the ratchet or notched hub, which is placed upon the fixed spindle.

"Hartshorn Reissue 7,370."

This invention of Hartshorn in view of the prior patents, is necessarily limited to details of construction—to the precise construction and arrangement of the parts as described in this patent.

Compt.'s Record, Kittle, fol. 39.
" " Renwick, fols. 220, 223.

Hartshorn disclaims the arrangement of the pawl and ratchet upon or in connection with the roller, so that the roller can be removed from its brackets without permitting the spring to unwind;

And, claims as follows:

> "In a spring shade roller having a pawl or detent and ratchet or their equivalent constructed and arranged so as to engage automatically for holding the shade at any desired point or height, the combination with a ratchet, or its equivalent upon the stationary spindle or stationary part of the fixture, of a hinged or pivoted pawl, placed upon the end of the roller, and acting substantially at right angles to the ratchet or notched hub."

The *Campbell & Hartshorn Reissues* were sustained, as before stated, before the commencement of this suit, by the U. S. Circuit Court for the Southern District of New York, in *Hartshorn* v. *Floss*, on contested motions for a Preliminary Injunction and for Attachment on Contempt for violating the Preliminary Injunction granted on such motion.

(*Order for Injunction, Rec., p. 99 and 153.*)
(*Order for Contempt, Rec., p. 100 and 154.*)

Such decisions of that Court, made on contested motions, are entitled, it is submitted, to consideration by this Court.

These patents have also been sustained, since this suit was heard in the court below, by the U. S. Circuit Court for the District of Massachusetts, in *Hartshorn* v. *The Eagle Shade Roller Company*, decided on October 11, 1883, Lowell and Nelson, *J. J.*, and reported in 18 Fed. Rep., 90.

II. Do the rollers made and sold by the defendants contain and employ the inventions described and claimed in the patents in suit?

Assuming that the patents in suit are good and valid patents, and that the claims thereof alleged to be infringed are for patentable inventions—and these positions are in accordance with the earlier decision of the Circuit Court of the United States for the District of Massachusetts on final hearing in the suit of *The Salem Shade Roller Mfg. Co.* v. *Harris*, decided in 1875, and sustaining the David Patent, and with the later decision of the same Court in *Hartshorn* v. *The Eagle Shade Roller Co.*, decided in 1885, sustaining the Campbell and Hartshorn Reissues—

There can be no reasonable doubt upon the question of infringement; the testimony of the experts of complainant is also full and clear to the same fact. We do not consider it necessary, however, to occupy the time of the Court by reading such testimony, but shall only refer to it.

The testimony as to the infringement by the defendant's roller,

Of the David Patent, is to be found in the Record, at pages 40 and 41;

Of the Campbell Reissue, in the Record, at pages 38 to 40, and

Of the Hartshorn Reissue, in the Record at pages 35 to 38.

A comparison of the rollers marked "*Harris Rollers Nos. 1 and 2*," sold by the defendant in the suit brought upon the David Patent, by *The Salem Shade Roller Mfg. Co.* v. *Harris*, and held in that suit to be an infringement of the David Patent, with the rollers made and sold by the Appellees in this suit, also show that the rollers in the two cases are substantially the same in construction and mode of operation.

Diagrams of such two rollers are here given.

The only difference between them is in the shape of the pawls and their location on the end plate. In the "Harris Roller" the engaging part or toe of the pawl is on the lower side of the pawl, and the pawl is pivoted on the outside of the end plate, exposed to view; while in the "Saginaw Barrel Co.'s Roller" the pawl is a hooked pawl, so called, its engaging toe being at the end opposite to its pivot, and the pawl is pivoted to the inner side of the end plate, and thus hid from sight.

Unless the decision of the Court in *Salem Shade Roller Manufacturing Co.* v. *Harris* is to be held erroneous in deciding that the "Harris Roller," with its pawl and ratchet differing in form and arrangement from the pawl and ratchet of the David Patent, was an infringement of said patent,

And the Davis Patent is to be construed as covering *only the specific form* and arrangement *of pawl and ratchet* shown in it,

It must follow, it is submitted, that the roller made and sold by the defendants in this cause is also an infringement of the David Patent.

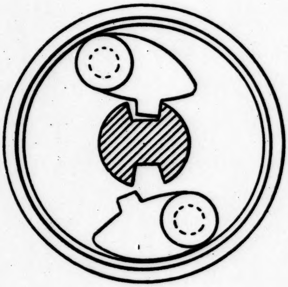
III. Are complainants patents good and valid? What are the defenses made thereto by the Defendants, and are they sustained?

A. PRIOR INVENTIONS.

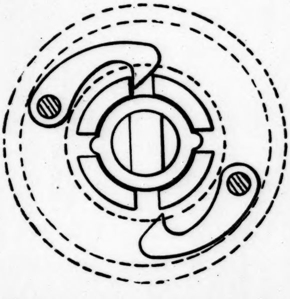
The principal, and perhaps it may be said the only real defense raised in this suit by the Defendants is:

That prior to any of the Patents in suit, and prior to Hartshorn's Patent of 1864, a Shade Roller existed, and was described and patented, which had and employed an Automatic Pawl and Ratchet, so constructed and operating that their engagement and disengagement was controlled and regarded by the varying speeds of the revolution of the roller;

Harris Roller.



Saginaw Barrel Co. Roller



That the pawl and ratchet were so arranged that they would retain the same relation to each other, whether the roller was in or out of its bearings, so as to prevent unwinding of the spring;

And in which the pawl was pivoted, and acted substantially at right angles with the ratchet;

And that, in view of such prior structure, the Patents sued upon must be limited and confined to the particular construction and arrangement of pawl and ratchet, shown in said Patents:

And that, therefore, the Rollers of Defendant do not infringe upon any of Complainant's Patents.

The Patent put in evidence by Defendants, and relied upon to prove the existence of such structure, is that granted in England to Edward Smith, No. 12,375 of 1848, and which is marked "Defts.' Exhibit Smith's English Patent."

The invention set forth in said Patent is declared to be for "Improvements in Window Blinds, and in Springs applicable to Window Blinds, Doors and other like purposes."

The "Improvements in Springs, 'applicable to window blinds, doors and other like purposes,' consist in the application thereto of a description of springs, commonly called torsion springs, never hitherto used for that purpose."

Torsion springs are those in which is utilized the force with which a rod or piece of metal or other material, when twisted, tends to return to its normal position.

Knight's Mech. Dictionary: Torsion Spring.
Compt's Record, p. 56; Renwick, Int. 22.

These improvements however have no relation to anything in the present suit, and may be passed without further consideration.

The "improved modes or means of raising or lowering roller window blinds" described in said Patent are two in number, as follows:

> A. "The first consists in dispensing with the spring ordinarily used to keep the pawl in the ratchet;" and,
>
> B. "The second consists in a more convenient method of pulling the endless cords by which the blinds are raised and lowered."

This second improvement (B) may also be passed with this mention of it, as it has no bearing in the present suit.

The first improvement in "modes or means of raising or lowering roller window blinds" is thus described in the Smith Patent.

> It "consists in dispensing with the spring ordinarily used to press the pawl on the ratchet wheel which controls the action of the roller. I effect this by *weighting the short or inner end* of the pawl, as shown in Fig. 1 of the annexed Drawings, so that when it is desired to cause the pawl to catch into the teeth of the ratchet, *it is only necessary to relieve it of part of the weight of the cord and tassel by holding it up by the hands.* The operation is thus perfectly noiseless."

The drawing of the Patent shows in "Fig. 5ᴬ" a pawl "with the spring ordinarily used to press the pawl on the ratchet wheel" (and which spring the patentee desired to dispense with); and in "Fig. 1" a pawl, having the "short or inner end" weighted (so as to dispense with the spring), and with a cord attached to its outer end.

The description in the body of the specification, as to the operation of the roller, has reference, so far as the pawl is concerned, to a pawl having a spring to keep it in engagement with the ratchet, and does not specially relate to the operation of the weighted pawl.

The object of Smith's invention, "in dispensing with the spring ordinarily used," seems to have been to obviate and get rid of the clicking noise produced by the pawl dropping, under the force of the spring, into the ratchet teeth, as the shade is pulled down. The patentee says, after describing the construction of pawl by which "he effects dispensing with the spring," and in what manner he causes his weighted pawl to engage with the ratchet teeth:

"The operation is thus perfectly noiseless."

How, or by what means, Smith "dispenses with the spring ordinarily used to press the pawl in the ratchet wheel," and in what manner his new pawl is to be operated, is set forth by him as follows:

> "I effect this (that is, dispensing with the spring ordinarily used to press the pawl on the ratchet wheel), *by weighting the short or inner ends of the pawl*, as shown in Fig. 1 of the Drawing, *so that when it is desired to cause the pawl to catch into the teeth of the ratchet, it is only necessary to relieve it* (the pawl) *of part of the weight of the cord and tassel, by holding it up by the hands.*"

From this description in the Smith Patent, and an examination of Fig. 1 of the Drawing therein, the following conclusions, it is clearly evident, are fully warranted:

1st. That the *weight* applied to the "short or inner end of the pawl" was to take the place of "the spring ordinarily used."

2d. That there was to be attached to the outer end of the weighted pawl a cord and tassel (as indicated in Fig. 1); as otherwise there would be no cord or tassel to be "held up by the hands," "to cause the pawl to catch into the teeth of the ratchet."

3d. That as it was "necessary," in order "to cause the pawl to catch into the teeth of the ratchet," "to relieve it of part of the weight of the cord and assel," the weight of such cord and tassel must be, when not lifted, greater than the weight of "the short or inner end of the pawl;" as otherwise there could be no "necessity" of relieving the pawl of part of the weight of such cord and tassel, "to cause it to catch into the teeth of the ratchet."

This explanation and interpretation of the meaning of the Smith Patent, would seem, from the language used, so plain and natural and so accordant with common sense, as to be self-evident, and not to admit of doubt of its correctness.

If this interpretation be not correct, and if the weight of the cord and tassel, attached to the outer end of the pawl does not act, by reason of their greater weight as compared with the weighted short or inner end of the pawl, to keep the pawl out of the ratchet, except when such cord and tassel are lifted by the hand "to cause the pawl to catch into the teeth of the ratchet," then the pawl would be continually in engagement with the teeth of the ratchet, and "the operation" of the roller would be no more "noiseless" than when the spring was used; the object or purpose of the improvement would in such case be entirely defeated.

It is also perfectly evident, from the mere examination of Fig. 1 of the Drawing, that the pawl shown in that figure, when engaged with the ratchet, will permit no upward movement of the shade, until the pawl is, by some means, lifted from the ratchet; and that, if the greater weight of the cord and tassel does not act, when not lifted, to keep the pawl out of the ratchet, the pawl will continually remain in engagement therewith, and will operate in the same manner, and with the same "noise," as would the spring pawl.

The construction and operation of the roller, described in the Smith Patent, insisted upon by the Complainant as before expressed, is fully supported by the testimony of both of the Experts of Complainant, Renwick and Kittle.

Renwick, Int. 11 to 14, Compt.'s Record, pp. 36 to 40.

Kittle, Int. 5 to 9, 10 to 13, Compt.'s Record, pp. 82 to 85, 86.

The Expert of Defendants, Dr. Hagan, however, finds, or pretends to find, in the Smith Patent and Roller, *an Automatic Pawl and Ratchet*, constructed, to use his language, to operate, "so that when the curtain was moved rapidly the pawl would overrun the ratchet so as not to engage with it, but when moved slowly the pawl would drop into the ratcheted hub, engage with it, and so stop the revolution of the roller,"—or having the same operation, which is found in the rollers described in the Patents sued upon, and in the Defendants' roller.

Dr. Hagan's explanation and interpretation of the construction and operation of the Smith Roller is found in Defendants' Record, as follows:

Int. 17, p. 24; from line 7 to 17.

Int. 20, p. 26; lines 17 to 28 inclusive.

He however admits, on his cross-examination;

That there is no description, statement or language in the Smith Patent, that the Smith Roller operates as asserted by him, namely, "when the curtain is moved rapidly the pawl would overrun the ratchet so as not to engage with it, but when moved slowly the pawl would drop into the ratchet and stop the revolution of the roller."

Cr. Int. 49, p. 50; Defts.' Record.

And, that there is no statement or intimation in the Smith Patent (except that before quoted, as to dispensing with the spring by weighting the inner end of the pawl, etc.), to the effect that the Smith Roller can be operated by handling the curtain alone, which could be done *if the pawl and ratchet were automatic.*

Cr. Int. 50, p. 50, Defts.' Record.

Dr. Hagan also testifies that the "cord and tassel" attached to the outer end of the Smith pawl is *not* heavier than the weighted short or inner end of the pawl;

And when asked to explain the meaning of the clause in the Smith Patent,

> "When it is desired *to cause the pawl to catch into the teeth of the ratchet it is only necessary to relieve it of part of the weight of the cords and tassel*, by holding it up by the hand,"

replies:

"My opinion is, that means taking hold of the *tassel upon the bottom of the curtain* and raising the curtain a little."

Defendants' Record, Cr. Int. 37, 38, pp. 46, 47.

But such explanation wholly fails to show or make intelligible *how* the lifting "of the tassel upon the *bottom of the curtain* and raising the curtain a little" can act "to relieve the *pawl* of part of the weight of the cord and tassel," or "to cause the pawl to catch into the teeth of the ratchet."

And he admits, on his further cross-examination:

"That no way is shown or described in the Smith Patent to cause the weighted pawl to catch into the teeth of the ratchet, except by lifting the cord and tassel attached to it."

Defendants' Record, Cr. Int. 39, 48, pp. 46, 49.

The pawl shown in Fig. 1, that is, the weighted pawl, after it has been brought into engagement with any tooth of the ratchet, is held in engagement by the spring in the roller "forcing the straight side of the tooth against the pawl, thereby causing an amount of friction between them which will not be overcome by the weight of the tassel" (Renwick, Defendants' Record, p. 38, fol. 152), and it is wholly impossible that the lifting of the tassel at the bottom of the curtain should cause the pawl to engage with the ratchet. The only effect of *lifting* the cord and tassel *upon the bottom of the curtain* would be, to diminish by so much the weight of the curtain, as a whole, and consequently the spring would then act with increased effect to hold the pawl and ratchet in contact with each other.

With a construction of roller, such as is described in the Smith Patent, and, with a pawl and ratchet engaging with each other in the manner shown in Fig. 1 of the drawings of such patent, it is submitted that it is absolutely impossible that there could be any such operation—having the engagement or disengagement of the pawl controlled by the varying velocities of the roller ;—as is asserted by the Defendants' Expert.

The testimony of the Defendants' Expert, Hagan, as to the operation of the Smith Roller, is examined and commented on by the Experts of the Complainant, who give their reasons why they consider such testimony incorrect and erroneous.

Renwick, Int. 14, Compt.'s Record, pp. 40 to 43.

Kittle, Int. 9 to 13, Compt.'s Record, pp. 85 to 87.

The Defendants have, it is true, put in evidence a roller marked "Exhibit's Model Smith's English Patent," which their witnesses allege is made in accordance with the specification and drawing of the Smith Patent.

Defendants' Record : Noyes, p. 17 ; Int. 4.
" " Hagan, p.24; Int. 18.

And such model roller, *as it is constructed*, is capable, it is admitted, of the operation ascribed to the Smith structure by Defendants' Expert ; that is, "when the roller is revolved rapidly the pawl will overrun the ratchet so as not to engage with it, but when moved slowly the pawl will drop into the ratcheted hub."

But, notwithstanding the positive assertion of both of Defendants' witnesses, Noyes and Hagan, that such Model roller " is constructed fairly and correctly according to the specification and drawing of the Smith patent," it is submitted that a mere comparison of such Model with Fig. 1 of the Smith drawing, as to the form of pawl and ratchet and their operative position and relation to each other, will show that such Model is *not* in accordance with the Patent, but is materially different therefrom.

The capability of the roller to permit the engagement of the pawl with the ratchet, under a slow revolution of the roller, and to prevent such engagement under a rapid revolution of the roller, must, of course, depend upon the relative shape and position of the pawl and ratchet, with respect to each other; and while the relative shape and position of these parts in the Model are such as to permit such described operation, that form and arrangement of pawl and ratchet found in that Model does not exist, and cannot be found in the Smith Patent.

The difference between the form and arrangement of the pawl and ratchet in the two structures, and their capacity and possible extent of engagement, is forcibly shown by the Drawing found opposite page 44 of the Complainant's Record, in which "Fig. A" is a tracing from Fig. 1 of the Smith patent, and "Fig. B" is a correct drawing of the ratchet wheel, weighted pawl and trigger of " Defendants' Exhibit Model Smith English Patent (Renwick, fol. 176)." It needs no argument to prove that the pawl and ratchet shown in Fig. B will permit an operation of the roller, which cannot be effected by the pawl and ratchet shown in Fig. A and in Fig. 1 of the Smith Patent.

The Complainant has also put in evidence a Model of the Smith Roller, which is marked " Complainant's Exhibit Smith Roller 1." In this Model, produced by the complainant, "*the ratchet wheel*

Hartshorn v. Saginaw Barrel Co. et al:

Complts Exh: Drawing of Pawls and Ratchets. Oct: 25. 1882.

S.N.W. Exr.

Fig. A.

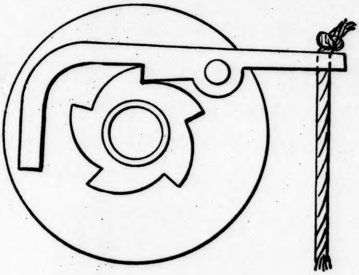
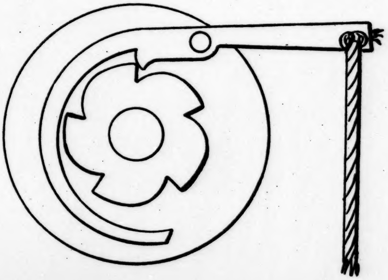


Fig. B.



and pawl, with its trigger and its weighted tail, are identical in form with those described and represented in the Smith Patent, and are so combined that the acting face of the pawl and the tooth will engage to the same extent as they do in the patent."

This identity is not only proved by the testimony (Renwick, Int. 7, Compt.'s Record, page 48, fol. 191), Kittle, Int. 15, Compt.'s Record, p. 90, fol. 359, but is also apparent from a comparison of such Model with Fig. 1 of the drawing in the Smith Patent.

This Model also establishes the incorrectness of the Defendants' pretended "Model Smith's English Patent."

As to whether the Defendants' Exhibit "Model Smith English Patent," is or is not in accordance with the Smith Patent, see further the evidence of the Experts of Complainant.

Renwick, Int. 15 and 16, Record, pp. 44 to 47.

Kittle, Int. 13, Record, pp. 87 to 89.

And see also the testimony of the same witnesses as to Complainant's Exhibit "Smith Roller 1," and its agreement with the structure described in the Smith Patent.

Renwick, Record, pp. 47 to 49, Int. 17.

Kittle, Record, pp. 89, 90, Int. 14, 15.

Dr. Hagan also testifies that the roller described in the Smith patent, is so constructed that "the roller could be taken out of the bracket, and removed therefrom without unrolling or disturbing the parts in the least; *all the effort necessary to do it would be to take the roller from out* its bearings."

Defts.' Record, p. 24, Int. 17, last clause of answer.

Defts.' Record, p. 26, Int. 20, lines 28 to 32.

He, however, admits on cross-examination that there is no description or statement to that effect in the Smith patent, and that there is no description or illustration in that patent of any bracket which will admit of such ready removal

Defts.' Rec., pp. 51, 52, Cr. Int. 51 to 54.

And that, in making such statement as to such possible removal, he "assumes *the general method of attaching* to have been employed."

Rec., p. 52, Cr. Int. 53.

By "*general method of attaching*," Dr. Hagan evidently refers to the "general method" *now in use*, and such as is shown in the Defendants' Exhibits "Model Smith English Patent;" but there is no evidence that any such "general method" was known or in use at the time of the Smith patent, or that Smith had any idea of such a method.

Interpreting the Smith patent from its own declarations and illustrations, and not assuming or incorporating into it later constructions, it is manifest that Smith had no idea or intention of a shade fixture or roller which would have the capacity of ready removal from its bearings or brackets; but, on the contrary, the connection of his fixture with the window was a permanent one, and not a temporary or detachable one, and one which would not permit any removal of the roller when once put up, except by an actual severance or removal of some of the parts by which it was supported.

The Smith roller, of course, *could* be removed from its brackets, and so could it have been, if the bearings had been made an integral part of the window casing, instead of having been screwed to it, by taking down the parts, one or both, which held and supported it—in either case the connection would be a fixed one, as contradistinguished from a temporary or removable one; but there is as much difference between the Smith roller and the roller in the Campbell reissue, as to removability, as there is between a structure, as a desk, the several parts of which are fitted together and then nailed or screwed to hold them in position, and the same structure in a "knock-down" shape, the several parts of which are adapted to connect with or be separated from each other by the construction of the joints, and requiring no other fastening.

As to the capacity, or rather want of capacity existing in the Smith roller, of removal from its brackets, see also the testimony of complainant's experts.

Renwick, Int. 15, p. 46, fols. 181 to 183, Cr. Int. 62, p. 72.
Kittle, Int. 17, 18, pp. 91, 92.

And as to "Davies English Patent," Cr. Int. 28, p. 62.

As to the provision for such removal existing in the Campbell patent, see

Kittle, Int. 11, p. 13, fols. 52, 53.
Renwick, Int. 20, p. 54, fol. 216.
" Cr. Int. 67, p. 75, fol. 300.
" Int. 70 and 71, p. 76.

From a careful examination of the Smith English Patent, No. 12,375 of 1848, and a consideration of all the evidence in the present suit in reference thereto, it is submitted, that the construction and operation of the roller, described and shown in such patent, as stated by the Expert of the defendants, is not in accordance with such patent, and cannot be sustained:

That said Smith patent does not describe or show, or make intimation of an *Automatic Shade Fixture*, or a roller having a "ratcheted hub * * and a pawl constructed to operate * * so that when the curtain was moved rapidly the pawl would overrun the ratchet so as not to engage with it, but when moved slowly the pawl would drop into the ratcheted hub, engage with it, and so stop the revolution of the roller:"

And that said Smith patent does not show a shade fixture, "having a pawl and ratchet or other equivalent arranged to engage automatically with each other," and so arranged with respect to the roller "that when it is removed from its brackets the tension of the spring will be preserved."

And also that the model "Defendants' Exhibit Model Smith's English Patent," is not made in accordance with that patent and cannot be regarded and accepted as a correct and truthful reproduction or illustration of the fixture, described and shown in that patent.

But that the roller which is described and shown in that patent is fairly and correctly represented in the Complainant's Exhibit "Model Smith's Roller 1."

But, even if it was conceded or established beyond question, that the roller shown and described in the Smith patent was *an automatic roller*, the pawl of which would engage, or be kept from engaging with, the ratchet, by the varying speed of the revolution of the roller, that patent could not be considered, as in any way, or to any extent, anticipating the *David Patent;* as the Smith patent shows and describes only a stationary pawl, and does not show or describe a pawl or detent "arranged upon the roller in such a manner that it moves toward and away from the center or axis of the roller by the action of gravity and centrifugal force," which is the gist of the David structure.

And if the Smith roller could be removed from its brackets, or is to be considered a removable roller, even in such case it is submitted, that the Smith Patent is not, in any legal sense, an anticipation of the *Campbell Patent*, though in the Smith roller the spring is locked by the pawl and ratchet, and will not unwind when the roller is taken from its brackets or bearings.

The fact that this result is obtained in the Smith Patent does not anticipate or render invalid the combination claimed in the first claim of the Campbell Patent.

Other elements or features, besides that of the locking of the spring when the roller is removed from its bearings, enter into the combination claimed in the Campbell Patent, and are necessary for the operation of such combination. These are not found in the Smith Fixture, and are such as required the exercise of invention to combine and arrange as they are found in said Campbell patent, and to operate in the manner therein described.

That this is so is clearly and conclusively shown by the testimony of Complainant's Experts, Renwick and Kittle.

> Complt.'s Record, pp. 72, 73 ; Renwick, Cr. Int. 62 to 64.
>
> Complt.'s Record, pp. 91–94 ; Kittle, Int. 17, 18.

An effort is also made by the Defendants to establish an *apparent similarity*, between the roller of the Smith patent and the rollers described in the Patents upon which this suit is brought, through the springs used in those rollers.

The Smith Patent shows a "torsion" spring of India Rubber, which is *twisted* upon itself, as threads are *twisted* to make a cord ; and Defendants' Expert, to prove such similarity, designates the springs found in these structures shown in Complainant's Patents as "torsional," or "torsionally acting" springs.

> Deft.s' Record, Hagan, Int. 13 (p. 19), 14, 15 (p. 20), 16 (p. 21), and Cr. Int. 1 to 16, (pp. 37–41).

Defendants' Expert admits that the springs found in the Complainant's Patents, and also in the Defendants' Rollers, are what are known as "coiled or spiral" springs ; but he claims that they "operate by torsion," and not as spiral springs, and to justify this position holds that the increasing of the coils, by pulling down the roller, effects "a *twisting* of the coil."

Deft.s' Rec., p. 39, Cr. Int. 9.

The explanation of the action of "torsion springs" and "coiled or spiral" springs, and the difference between the two, as given by Complainant's Expert is certainly more in accordance with general understanding, and, it is submitted, the most correct.

Compt.'s Rec, Renwick, p. 36, fols. 142, 143; pp. 56, 57, fols. 224 to 227.

Either kind of spring—a *torsion* spring, particularly when made of rubber, as in the Smith patent, which permits it to be twisted upon itself a great number of times, or a *spiral* spring, such as is found in complainant's patents, and in defendants' rollers—is doubtlessly capable of proving operative in shade rollers:

But we very much doubt whether any one will be induced to believe that a "torsion spring" and a "coiled or spiral spring" are the same, though the latter may be called a "torsionally acting spring;" or that *coiling* a wire is *twisting* it, or that the wire of a coiled spring is *twisted* by increasing the number of its coils.

This testimony of defendants' expert seems to be very technical; and is so, as we think, to a fault.

Other defenses are also raised by the defendants, going more specially to the validity of the patents sued upon.

B. AS TO THE VALIDITY OF THE REISSUES 7,367 AND 7,370.

Any such defense cannot, as a matter of course, have any relevancy or applicability to the *David Patent 69,189*, as that patent has never been reissued; the original patent is that in suit.

In respect to the *Campbell Reissue No. 7,367*, Defendants' Expert testifies, that he "finds that said Reissue has been expanded, and includes matter and elements which made no part of the original patent or its claim."

The expansion alleged as being found in said Reissue consists in the insertion in the first claim of the words "pawl and ratchet" (as synonymous with "detent"), which words defendants' expert declare describe "a distinct mechanical element, known as such in mechanics," and which element he alleges is "not described, mentioned or alluded to in the original patent."

Defendants' Record, Hagan, Int. 24, p. 31.

That witness also gives a definition of what *he* considers "a pawl," as follows:

> "A pawl is a claw pivoted at one end and arranged to allow of the progressional or recessional motion of a ratchet wheel with which it engages; these are what are denominated push pawls and pull pawls, one kind which engage with a ratchet to hold it and arrest its motion, and another to engage with it and move the ratchet."

Defts.' Record, Hagan, Int. 23, p. 30.

He is however unable to give any authorities sustaining his definition of "a pawl."

Cr. Int. 61, p. 53.

Or that the particular device he describes was known as a distinct mechanical element under the name of a "pawl."

And he is unable or unwilling to answer the question put him: "To answer definitely as to the difference between '*pawls* and *detents*.'"

Cr. Int. 65 to 69, p. 54.

Though he does admit that a pawl may be used as a detent, and that the words are sometimes used synonymously.

Cr. Int. 68, p. 55.

Defendants' expert also admits that there is no other or different mechanism described in the Campbell reissue than is described in the original patent; he says "the *same mechanism* is *differently described* and this *difference in description* is what I meant by an interpolation."

Defendants' Record, Hagan, Cr. Int. 73, p. 56.

According, therefore, to the defendants' own showing, the Original and Reissue both describe "the *same mechanism*," operating in the same way and for the same purpose.

And the extent of the interpolation in the Reissue, and which he calls "an expansion" of the invention, consists in calling "the pins or bolts" of the original patent (which are admitted to be "detents") "*pawls or* detents," in the Reissue.

There is not a particle of evidence, except the bare, unsupported assertion of Defendants' expert, that the word "pawl" has in mechanics any certain definite meaning, or is used by mechanics as descriptive of a particular and definitely organized and operating mechanism; and particularly of such a specific mechanism as described by Defendants' expert, according to whose definition, "a pawl" must be "pivoted," and is limited to two classes or kinds —"push pawls" and "pull pawls."

The weight of authority is decidedly, it is submitted, to the contrary, and that the words "pawl" and "detent" are used synonymously, and as descriptive of the office or function performed by them, and not of any particular organized device.

Definitions of "pawls" sometimes speak of them as "pivoted," sometimes not; but in no definition that we have been able to find is there any reference to their classification or division as "push pawls" and "pull pawls."

Webster defines "Pawl" as "a short, movable bar, to check the backward movement of a wheel, windlass, etc.; a catch, click, detent or ratchet."

Worcester defines "Pawl" as "a piece which falls between the teeth of a ratchet wheel; a click or detent."

Knight (Mech. Dic., "Pawl") defines "Pawl" as "a pivoted bar adapted to fall into the notches or teeth of a wheel as it rotates in one direction, and to restrain it from back motion."

He further says, "the same device is called a click, when acting in connection with a ratchet wheel, as in the winding part of a watch."

And adds further, "It is sometimes called a *detent.* This is its office, but the thing has already names enough."

And the same authority defines "Detent" as "a pin, stud or lever forming a stop in a watch, clock, tumbler-lock, or other machine; it is variously called in specific cases as click, pawl, dog, fence, etc."

Compt.'s Record, p. 106.

The evidence of both of Complainant's Experts is also clear to the point, that no different invention is shown and described in the Campbell Reissue than is shown and described in its original; and that giving in the Reissue to the "pins or bolts" of the original, which act as "pawls or detents," and to the "flattened or ratchet shaft," which is in fact "a ratchet," the names which properly characterize their operation, does not substantially change the description of the reissue from the description of the original patent.

Compt.'s Rec., Renwick, Int. 23, pp. 57, 58.
Compt.'s Rec., Kittle, Int. 21, p. 95.

The only objection raised against the *Hartshorn Reissue 7,370* is—

That a new figure—"Fig. 3,"—has been added to the drawing; and that "Fig. 1" is described as "a longitudinal, central section of a roller * * * taken on the line *x. x.* of Fig. 2," but that the "line *x. x.*" is "placed upon the interloped figure (*sic*, Dr. Hagan) and left off the figure 2."

Defendants' Record, p. 32, Int. 25.

This is a criticism too frivolous to merit an answer, when the figures of the reissue and of the original patent are examined.

But as to whether the *Hartshorn Reissue 7,370*, shows and describes any different invention from that which is described in the original of such reissue—see the testimony of Complainant's Experts.

Complainant's Record, Renwick, p. 58, Int. 24.
Complainant's Record, Kittle, p. 96, Int. 22.

The Reissues in suit are legal and valid under the Patent Acts and the decisions of the Courts.

The provision of the statute as to reissues is, of course, familiar to the Court, but for convenience of reference is here quoted.

> "Whenever any patent is inoperative or invalid by reason of a defective or insufficient specification, or by reason of the patentee claiming, as his own invention or discovery, more than he had a right to claim as new, if the error has arisen by inadvertence, accident or mistake, and without any fraudulent or deceptive intention, the Commissioner shall, on the surrender of such patent and the payment of the duty required by law, cause a new patent, *for the same invention and in accordance with the corrected speci*

> *fication*, to be issued to the patentee * * * for the unexpired part of the term of the original patent."

To more effectually secure the end in view, that the "new patent" should be "for the same invention," the same section of the statute further provides.

> "But no new matter shall be introduced into the specification."
>
> Rev. Statutes U. S., § 4916.
> Act 1870, chap. 230, § 53.

The statute, it will be observed, only requires that the reissue shall be "*for the same invention*," and does not, directly or by implication, impose any condition that the *description of invention* should be the same in the reissue as in the original, or that the claims should be the same in the reissue as in the original.

The extent and meaning of this prohibition, "no new matter shall be introduced into the specification," has been declared by the Supreme Court, as follows:

> "The specification may be amended so as to make it more clear and distinct; the claim may be modified so as to make it more conformable to the exact rights of the patentee, but the invention must be the same * * * This prohibition (above quoted) is general, relating to all patents; and by "new matter" we suppose to be meant *new substantive matter, such as would have the effect of changing the invention*, or of introducing what might be the subject of another application for a patent.
>
> The danger to be provided against was the temptation to amend a patent so as to cover improvements *which might have come into use, or*

might have been invented by others, after its [the original patent] issue.

> *Powder Co.* v. *Powder Works*, 98 U. S., 126, 138 (1880).

This interpretation of the meaning of said "prohibitory clause" was recognized and followed in

> *Siebert Oil Cup Co.* v. *Harper Lub. Co.*, 4 Fed. Rep., 328, 333 (1880).

The later decisions of the Supreme Court, and of various Circuit Courts following the decisions of the higher tribunal, have defined, more clearly than had been done in the earlier cases, and established what is, and what is not, "the same invention;" and under the principles of construction laid down by the Supreme Court, many Reissues, granted under the former loose practice, have been held void. The decisions in all such cases, however, were based on the ground that the Reissues had been so altered and expanded as to describe and include other and different mechanism or combinations of mechanism, than were described in the original patent.

> *Ball* v. *Langles*, 102 U. S., 128, 1880.
> *Garnier* v. *Dozier*, 102 U. S., 230, 1880.
> *Miller* v. *Brass Co.*, 104 U. S., 350, 1881.
> *James* v. *Campbell*, 104 U. S., 356, 1881.
> *Bantz* v. *Frantz*, 105 U. S., 160, 1881.
> *Mathews* v. *Mac. Co.*, 105 U. S., 54, 1881.
> *Johnson* v. *R. R. Co.*, 105 U. S., 539, 1881, and other cases.

Under the statute above quoted it has been determined by the Courts in these later cases:

That the specification may be amended.

> *Powder Co.* v. *Powder Works, 98 U. S., 126* (above quoted).

That both specification and claim may be corrected:

There may be a corrected specification—that is, one corrected in respect to description or claim, or both—and there may be a new patent in accordance therewith, but the new patent must be for the same invention. This does not mean that the claim in the reissue must be the same as the claim in the original.

Wilson v. *Coon*, 18 Blatch., 532, 535, 1880.
Same v. *Same*, 5 Fed. Rep.; 611, 1880.
Smith v. *Merriam*, 6 Fed. Rep., 713, 1881.

That new claims may be added.

Miller v. *Brass Co.*, 104 U. S., 350, 352, 1881.
James v. *Campbell*, 104 U. S., 356, 1881.
Combined Can Co. v. *Lloyd*, 11 Fed. Rep., 149, 150, 1882.

And that, although the act as to Reissues provides only correcting defects in the specification, and for cases where more had been claimed than the patentee had the right to claim, and does not, in terms, authorize a reissue to enable a patentee to expand his claim, *a claim may be enlarged* in a reissue, at least when an actual mistake has occurred.

Miller v. *Brass Co.*, 104 U. S., 350, 353, 354, 355, 1881.
James v. *Campbell*, 104 U. S., 356, 371, 1881.
See also *Yale Lock Co.* v. *Scovill Mfg. Co.*, 3 Fed. Rep., 288.

Many of the later cases have also held that unreasonable or unnecessary laches or delay in applying for a Reissue would affect the right to a reissue; on the grounds that an omission to claim devices, described and shown in the original patent, may be regarded as a dedication to the public of that which is not claimed; and that application for the correction of a patent should be made before other inventors have produced new forms of improvements; or before "adverse rights have accrued."

> *Miller* v. *Brass Co.*
> *James* v. *Campbell*, and other cases.

What is such an unreasonable delay or within what time, after the grant of an original patent, a Reissue must or should be applied for, has not been determined in any of the cases.

The only opinion expressed upon this point is that found in *Miller* v. *Brass Co.*, in which Mr. Justice Bradley says:

> "If two years' public enjoyment of an invention with the consent and allowance of the inventor is evidence of abandonment, and a bar to an application for a patent, a public disclaimer [that is, an omission to claim something shown] in the patent itself should be construed equally favorable to the public."

In a later case, another learned Judge, in commenting upon this opinion of Mr. Justice Bradley, says:

"He intimates that two years, in analogy to the law of forfeiture, would be the utmost possible limit of time; but, as I understand the opinion, that anything like two years would be inadmissible in ordinary cases."

> *Jones* v. *Barker*, Lowell, *J.*, 11 Fed. Rep., 597, 599 (1882).

In the case of an application for Reissue, when an *actual mistake* has occurred—not a mere error of judgment—but a real *bona fide* mistake no presumption of abandonment would seem to exist.

> *Miller* v. *Brass Co.*
> *Grant Pow. Co.* v. *Cal. Pow. Co.*, *4 Fed. Rep., 720, 725.*

And in cases where no "adverse rights have accrued," the principle or rule as to "unreasonable delay" would have no application.

The principles established by these decisions fully justify and sustain the Reissues in the present suit.

A comparison of the Reissues in suit with their Originals, shows as before pointed out, that the same mechanism or devices which are shown and described in the Reissues are shown and described in their Originals, and that in each the devices or mechanism have the same operation.

That such is the fact is also admitted by the defendants; and the only interpolation or expansion charged is, that the "same mechanism is *differently described*" in the reissue; such difference consisting "in the use of the term *pawl*, disjunctively with that of detent and ratchet."

Defendants' Record, Cr. Ints., 73 to 76, pp. 56, 57.

The facts connected with the history of the Reissues in suit, and their Originals are peculiar; and probably have no parallel.

On *August 2, 1867*, the complainant Hartshorn filed an application in the Patent Office for a patent for Improvement in Shade Rollers, on which *Letters Patent, No. 68,502*, were granted to him on the *3d day of September following;* this patent has been put in evidence by the defendants.

Complainant's Record, p. 106.

The construction and operation of the roller shown and described in that patent of Sept. 3, 1867, No. 68,502, is the same as that shown and described in the *Hartshorn Reissue, No. 7,370*, one of the patents in suit, and which is a reissue of said patent, No. 68,502.

Patent No. 68,502, and Reissue 7,370.

The claim in that original patent No. 68,502 was substantially the same as the *first claim* in the "*Campbell Reissue 7,367*," viz.:

> "The attaching of a pawl and ratchet, or notched hub, to a window shade roller provided with a spring. or to parts connected with said roller, in such a manner that the tension of the spring will, without any manipulation or adjustment of parts whatever, always be preserved, whether the roller be fitted in the brackets or bearings or removed therefrom, substantially as set forth."

At the time the Complainant made application for and obtained said Patent No. 68,502, he believed himself to be the first and original inventor of the arrangement of pawl and ratchet, as described in said patent to effect the purpose or end claimed.

Compt.'s Record, Hartshorn's Tes., p. 103, Int. 4.

In the same month and year, in which Hartshorn applied for a patent for his invention patented to him Sept. 3, 1867, and only sixteen (16) days later, that is *on August 19, 1867*, William Campbell applied for a patent for Improvement in Shade Rollers and such application there were granted to him *on the 24th day of September*, *1867*, Letters Patent *No. 69,176;* this patent No. 69,176 has also been put in evidence by the defendants.

"Campell File Wrapper."

The roller described and shown in said patent No. 69,176, is the same as that shown and described in "*Campbell Reissue, 7,367,*" which is a reissue of said patent, No. 69,176.

Patent No. 69,176, and Reissue 7,367.

The claim in such original Campbell Patent No. 69,176 was the same as the *third claim* in the "Campbell Reissue 7,367."

Both of these applications—that of Hartshorn and that of Campbell—were made through the same solicitors, Munn & Co. (see Drawings in patents Nos. 68,502 and 69,176), though it does not appear that either applicant had knowledge of the application of the other; and probably they had not. The fact that the same solicitor prepared the specifications in both cases may, however, perhaps, account for the absence in the Campbell specification of any special reference to the necessary result of the construction shown in that patent, viz.: that the tension of the spring would be preserved, whether the roller was in or out of its bearings.

[On the *8th day of August*, in the same year, Jacob David filed his application for a patent for his invention, and on which the *Letters Patent, No. 69,189*, in suit, was granted to him on the *25th day of September, 1867*, the same day on which the Campbell Patent, No. 69,176, was granted.]

"David File Wrapper."

The rollers in all these three patents—Hartshorn's, Campbell's and David's—had pawls which moved towards and away from the center or axis of the roller; but such arrangement of the pawl was claimed only in the David Patent.

Hartshorn and Campbell held their respective patents, and no question appears to have arisen as to priority of invention, or which was the earlier invention of the arrangement of pawl and ratchet, by which the locking of the spring was effected.

In 1873 suit was brought in Massachusetts upon the David Patent, by *The Salem Shade Roller Co.*, then owning that patent, *against one William G. Harris*, who was selling rollers made by the Complainant, who assumed the defense of that suit. The roller sold by Harris had the pawl arranged so as to move towards and away from the axis of the roller, as described and claimed in the David Patent, but its pawl was different in form from that shown in the David Patent, and engaged with the spindle instead of with the bracket.

Complainant's Record, p. 104.
"Harris Rollers, No. 1 and No. 2."

The pawls in all these several patents—Hartshorn's, Campbell's and David's—moving towards and away from the center or axis of the roller in the same manner, and Hartshorn being aware that *his* invention was made only a very short time before he had filed his application for his patent (Compt.'s Record, pp. 105, 106), the inquiry arose in preparing the defense to the suit against Harris, whether Campbell might not be an *earlier* inventor than David of the centrifugally acting pawl.

To ascertain, if possible, this fact, Hartshorn applied to Campbell to learn *at what time* he had made his invention, and was given to understand that Campbell had made his invention about a year before he obtained his patent.

Campbell's name was thereupon set up in the answer in the suit against Harris as being a prior inventor to David of the invention claimed in the David Patent ("Harris Record," p. 96); and Hartshorn also purchased the Campbell patent.

In the putting in of testimony in the suit against

Harris, Campbell was called as a witness on the part of the defense, but on his examination failed to fix the time of his invention, with any certainty, *earlier than about the 1st of May, 1867.* David fixed the time of his invention as early as December, 1866, and his patent was sustained by the Court, and a decree was entered against Harris and an injunction ordered to issue.

"Harris Record," pp. 35, 103, 118.
See also Compt.'s Record, p. 107.

Campbell was examined as a witness, in the suit referred to, in May, 1874.

"Harris Record," p. 34.
Complainant's Record, p. 104.

And the decree in the Harris suit was entered in December, 1875.

"Harris Decree," Compt.'s Record, p. 29*.

The testimony of Campbell, though not found sufficient to antedate the David invention, showed that Mr. Campbell was, as respects Hartshorn, the prior inventor of that which was claimed in Hartshorn's Patent of Sept. 3, 1867, No. 68,502. In any suit upon the said Hartshorn Patent it is evident that Campbell's testimony would have defeated that patent.

Reissues of the said Hartshorn and Campbell Patents therefore became necessary, in order to legally protect the inventions described therein, and applications for such reissues were thereupon made by the complainant to the Commissioner of Patents; the claim which had stood in the Hartshorn Patent being transferred to and incorporated in the Campbell Reissue, and the claim in the Hartshorn Reissue being limited to the specific arrangement of pawl shown in the Hartshorn Original Patent.

These applications for Reissues were both made on the same day, *May 27, 1875*, and upon such applications the present Reissues 7,367, 7,370, were granted October 31, 1876.

Exhibit Campbell Reissue, 7,367.
Exhibit Hartshorn Reissue, 7,370.

Clearer instances of "actual" and "*bona fide* mistakes," as to the claims contained in Original Patents, can scarcely be imagined than existed in respect to these Hartshorn and Campbell Patents; and more equitable grounds and reasons for reissues could not exist in any case.

The applications for the Reissues in suits, though made some years after the grant of the Original patents, were, however, made very soon after the facts as to the actual time of Campbell's invention were ascertained, and *within two years* after such time facts were definitely established.

It is also to be observed, that between the time of the grant of the Original Campbell and Hartshorn Patents and their said Reissues, no adverse interests or rights could have accrued to the public to the thing claimed in the first claim of the "Campbell Reissue 7,367;" the thing therein claimed having never been open to, or enjoyed by the public, but having been protected, and rightfully as supposed, in the Hartshorn Patent, as against the public.

The public has never, directly or indirectly, possessed or enjoyed any right to the use of anything now claimed in the Campbell Reissue.

It is submitted that the testimony in the case fully establishes

That the patents in suit are good and valid patents;

That said patents or the inventions described and claimed therein are not anticipated by any of the Letters Patent put in evidence by the defendants;

That the reissues in suit, Nos. 7,367 and 7,370 are for "the same inventions" that are described and shown in the originals of said patents, and that said reissues were legally and properly granted;

That the "David patent No. 69,189" has been adjudicated and held valid by a Circuit Court of the United States, on final hearing, and that, upon well recognized rules of comity, said adjudication should be recognized and followed in this suit;

That the "Campbell Reissue 7,367" has been sustained by a Circuit Court of the United States, upon contested motions, and that such adjudications, upon like rules of comity, are sufficient to entitle said Patent to be recognized by this Court;

That the Rollers made and sold by the Defendants in this cause, contain and employ in their construction and operation the devices and combinations, described and claimed in the several Patents upon which this suit is brought;

And that the rollers made and sold by the defendants in this cause are substantially the same in construction and operation with the rollers which were held by the Court in the Harris suit to be an infringement upon the said David Patent 69,189.

It is to be noticed, however, that this same question of the validity of these Reissues No. 7,367 and 7,370, came before the U. S. Circuit Court of Massachusetts, before Lowell and Nelson, Justices, and after full argument and deliberation, both Reissues were sustained. The decision is found in the 18 Fed. Rep., 70, in the suit of *Hartshorn* v. *Eagle Shade Roller Co.*

A decree should be entered for the appellant against the appellees, according to the prayer of the Bill of Complaint.

S. D. & J. T. LAW,
Solicitors for Appellant.

S. D. LAW,
Of Counsel.

119-664

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1886.

No. 66

STEWART HARTSHORN,
Appellant,
vs.

THE SAGINAW BARREL COMPANY,
A. W. WRIGHT,
A. A. BROCKWAY, and
REUBEN KIMBALL.
Appellees.

Appeal from the Circuit Court of the United States for the Eastern District of Michigan.

Brief for Appellees.

SPRAGUE & HUNT,
Of Counsel for Appellees.

THE
SUPREME COURT
OF THE
UNITED STATES

OCTOBER TERM, 1885.

NO. 310.

STEWART HARTSHORN, Appellant, vs. THE SAGINAW BARREL COMPANY, A. W. WRIGHT, A. A. BROCKWAY AND REUBEN KIMBALL, Appellees.	In Equity.

BRIEF FOR APPELLEES.

MAY IT PLEASE YOUR HONORS:

This suit is brought on three different patents for improvements in Window Shade Fixtures or Rollers. The first is the patent of Stewart

Hartshorn, the Complainant, being the re-issue No. 7,370, of an original patent granted Sept. 3, 1867. The second is the re-issued patent of Wm. Campbell, No. 7,367, being the re-issue of an original patent granted Wm. Campbell, Sept. 24, 1867, and the third is the patent of Jacob David, dated Sept. 24, 1867, No. 69,189.

In the re-issue of Hartshorn, No. 7,370, is a disclaimer in which he admits that Campbell's invention of the improvement was prior to his, and therefore the Campbell patent is the first in time.

Before taking up the case it will somewhat assist in the elucidation of the matter bofore the court if we show the state of the art before the issue of these patents. The inventions in question are in that class of shade rollers which are rolled up by the unwinding or untwisting of a coiled or torsional spring, as both were used for this purpose, as the judgement of the user prompted. The roller was hollow and the spring was placed within it—one end being attached to the roller, and the other end to the shaft or rod on which the roller revolved. Sometimes this rod passed entirely through the roller and sometimes only partially through. As the curtain was drawn down the spring was wound up or twisted, and when the tension upon the curtain was released and the curtain allowed to roll up, the spring was unwound or untwisted, thereby producing the desired result. The upward motion of the curtain was controlled by a pawl and ratchet at one end of the roller, the pawl or the ratchet being attached to the bracket. The pawl was usually operated by a cord which was hung by the side of the window. By pulling down on this cord the pawl was disengaged from the ratchet and the curtain immediately rolled up under the action of the spring.

The record shows that these curtain rollers had been in use for some time in carriages before they were used in houses.

The Smith English patent of 1848 shows all the elements of the various combinations and performs almost all the functions of the subsequent inventions. In this patent the spring used was made of rubber and was a torsional one; the roller revolved on two shafts or two pins, one of which was fixed to the roller and revolved with it, the other being at the opposite end of the roller, extending into the same far enough to be attached to one end of the torsional spring, while the other end of the spring was fastened to the roller; the outer end of this shaft was made square to fit into the square hole in the bracket, which prevented its revolving with the revolution of the roller.

To this end of the roller was attached a cap or box containing a ratchet and a pawl, the ratchet being fastened to the end of the roller and revolving with it, while the pawl was pivoted on the inside of the outer plate of the box or cap, which fitted on the square portion of the shaft and was thus prevented from revolving with the roller.

This roller when the spring is twisted or wound up can be removed from its brackets without unwinding the spring.

This roller will wind up the curtain instantaneously when the pawl is placed on the top of the ratchet tooth, and the pawl will stop and hold the roller whenever the motion of the curtain is arrested.

It is true that the inventor does not set up a specific claim for this nor does he set up any claim in the meaning attached to that term in the law, for it is not required by the English patent law, but the inventor is, nevertheless, entitled to all the uses to which his invention can be put.

It the ratchet in the Smith English patent had only two teeth with the broad space between them as high as the points of the teeth, as in the Hartshorn of 1864, and the patents in suit, there could be no question of the anticipation.

The Davis English patent, Nov. 15, 1854, No. 2,416, shows what he calls the common construction of such rollers, and that shows a roller detached from its brackets. The shaft on which the roller turns passes entirely through the roller and the roller carries the ratchet, and the cap containing the pawl is also attached to the shaft.

In Hartshorn's first patent, dated Oct. 11, 1864, he made the ratchet by making two notches, one on each side, in the periphery of the ratchet wheel, and constructed his pawl to engage with such notches. The pawl was on the bracket and the ratchet was on the roller. When the curtain was drawn down the spring in the curtain was wound up and when the curtain was released, while the pawl rested on the perimeter of the ratchet wheel, the curtain would roll up and it would continue to roll up as long as the velocity of the curtain was sufficient to carry the notches in the ratchet past the pawl before it could fall into them.

Then we find in 1867 Hartshorn, Campbell and David all applying for patents, showing the pawl on the roller and the ratchet on the bracket, as in David, and on the non-revolving shaft as in Campbell and Hartshorn. These are the originals of the patents on which this suit is brought, but they have been re-issued, excepting David's, one of them twice.

The question of the validity of these patents should first be considered, and as the David patent is the oldest patent, we have taken that first, and after it, the Campbell and the Hartshorn.

THE DAVID PATENT.

Page 138 *of Record.*

The claims of the David patent are as follows:

"1. The arm or detent *k* arranged upon the roller in such a manner "that it moves towards and away from the center or axis of the roller *a* "by the action of gravity and centrifugal force, substantially as described.

"2. The combination and arrangement at the same end of the shade "roller, of the spring *e*, rod *d* and arm or detent *k* or their mechanical equivalents, substantially as described."

Merely bringing old devices into juxtaposition, and then allowing each to work out its own effect without the production of something novel is not invention.

Hailes vs. Van Wormer,
20. Wall. 353, (368).

The combination to be patentable, must produce a different force or effect, or result in the combined forces or processes, from that given by their separate parts. There must be a new result produced by their union, if not so, it is only an aggregation of separate elements.

Reckendorfer vs. Faber,
92. U. S. 347, (357).

These claims are for mere aggregations of elements which, by themselves, perform no duty. Can anything more useless be imagined than the falling towards and from the centre of the roller of the arm *k*, in first claim, or in the arrangement of the spring *e*, rod *d* and detent *k* at the same end of the roller in the second claim, without the addition of some element not mentioned in the claim. These aggregations produce no new result due to their juxtaposition.

The complainant's experts have tried to make these claims effective by interjecting the journal box *j* with the elevated end as a part of each and both of these claims—because, as they admit, the devices claimed are inoperative without this elevated end of the journal box—for without this elevated end of the journal box the roller would roll as long as the spring would carry it.

. This addition to the claim cannot be made any more than an element can be dropped out of a claim as useless.

In *Water Meter Co. vs. Desper*, 101 U. S. R. 332 (337), the court says:

"It may be observed before concluding this opinion, that the courts of this country cannot always indulge the same latitude which is exercised by the English judges in determining what parts of a machine are or are not material. Our law requires the patentee to specify particularly what he claims to be new, and if he claims a combination of certain elements or parts, we cannot declare that any one of these is immaterial. The patentee makes them all material by the restricted form of his claim.

In the case of *Dennis vs. Cross*, 6 Fish. 138 (141), Judge Blodgett says:

"Probably no principle of the patent law is better settled than that the patentee is limited by his claim. And the courts are only allowed to look at the detailed specifications, models or drawings, for the purpose of construing the *claim;* * * * * *Whipple vs. Baldwin Manf'g Co.*, 4 Fish. 29."

"Although the inventor might have claimed something different from what he has claimed, the court must, in the construction of the patent, be governed entirely by the claim he makes. *Kidd vs. Spence*, 4

Fish. 38."

In the case of *Railroad Co. vs. Mellon*, 104 U. S. 112 (118), the court says:

"In this case the description of the appellee's invention is much broader than his claim. It seems quite clear from the present form of his specification, and from the fact that his application for a patent was twice rejected, that he was compelled by the patent office to narrow his claim to its present limits before the Commissioner would grant him a patent. In doing this he neglected to amend the descriptive part of his specification. He cannot go beyond what he has claimed and insist that his patent covers something not claimed, merely because it is to be found in the descriptive part of the specification."

In the case of *Burns vs. Meyer*, 160 U. S. R. 671, the court says;

"It is well known that the terms of the claim in letters patent are carefully scrutinized in the patent office. Over this part of the specification the chief contest generally arises, it defines what the office, after full examination of previous inventions and the state of the art, determines the applicant is entitled to. The courts, therefore, should be careful not to enlarge, by construction, the claim the patent office has admitted, and which the patentee has acquiesced in, beyond the fair interpretation of its terms."

"That the patent is open to the fatal objection that the device covered thereby, did not, in view of the state of the art, involve the exercise of invention, and was therefore not patentable."

See Morris vs. McMillan, 112. U. S. 244, and cases there cited.

In the patent now before the court the claims are for a mere aggregation of parts; the combination in the first claim does not perform any duty unless combined with something else. The elements of the second claim form a mere collection of parts, which do not co-operate in any way among themselves. Both claims require something more to make them operative. If the patentee did not claim the necessary means to enable these combinations to act it is not the duty of the court to give them to him—for "although the inventor might have claimed something different from what he has claimed, the court must in the construction of the patent, be governed entirely by the claim he makes. *Kidd vs. Spence*, 4 Fish 38."

An inventor must be supposed to know of what his invention consist, and his patent does not secure to him the exclusive right in anything more than he claims to have invented,

Rich vs. Close, 4 Fish. 279, (282)

The actual claims cannot be rejected, the complainants must stand or fall by the claims as made.

Meissner vs. Devoe Manf'g Co., 5 Fish, 285, (289).

So in this David patent, he should be supposed to know what he has invented, and if by accident or mistake he had not claimed all that he invented he could have asked and obtained a re-issue.

It was as evident then that these claims were for combinations which of themselves performed no function, as it is now. Yet although this patent was issued in 1867, the patentee has never attempted to re-issue it—but his assignee endeavors to make it available by the allegation that the means necessary to render these combinations operative, are to be included in the claims, under the words, substantially as described. If the journal box with one side elongated, may be included under these words, "substantially as described" then the bracket must come in and the window frame, because the frame is necessary so support the bracket, as the bracket supports the journal box, and so we might go on adding what was necessary to the working of these combinations until we incorporate in the claims, "the round world and all that is therein."

This makes the David patent invalid.

This David patent is not the first patent for rolling up a curtain by the use of a spring in the roller, as it appears from the record. The Smith English patent, 1848, page 177 of Record, has the spring, the rod and the detent all at the same end of the roller.

The Davies English patent, 1855, page 180 of Record, shows the spring, the rod and detent at the same end of the roller.

The Hartshorn patent of 1864, shows the spring, the rod and the detent at the same end of the roller, but a mere mechanical change has been made, the pawl or detent has been placed on the bracket and the ratchet teeth on the rod. Therefore this David patent is to be narrowly construed, and the claims cannot be extended to cover any device which was in common use at that time.

Bridge vs. Excelsior Co., 105 U. S. R. 618.

The evidence shows that the defendants do not use the device shown and claimed in the David patent nor its equivalent. See Mr. Kittle's testimony, page 41 and X. Q. 20, and answer on page 42 of Record.

The patent of Wm. Campbell in this suit is the re-issue, No. 7,367, dated Oct. 31, 1876, of the original patent No. 69,176, dated Sept. 24, 1867. One of the defenses set up in the answer to the patent is: that it was not for the same invention as the invention shown, described and claimed in the original.

The law applicable to this case is found condensed in the case of

Bantz vs. Frantz, 105 U. S. R. 160, (163, &c.).

Miller vs. Brass Co., 104 U. S. R. 350, (355).

In this re-issue of the Campbell patent, there are three claims instead of the one of the original.

The first claim is the only one which the defendants are charged with infringing.

This claim is as follows:

"1. In a spring shade roller, having a pawl or detent and a ratchet, or their equivalent, so aranged as to allow the shade to be drawn down or run up without obstruction, and which engage automatically with each other to hold the shade in any desired position, the arangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that when the roller is removed from its brackets the tension of the spring will be preserved."

This claim is not found in the original, nor is the subject matter of the claim, the arangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that when the roller is removed from its brackets the tension of the spring will be preserved—referred to or indicated in any way in the original.

For the purpose of showing more plainly the interpolations of new matter in the re-issue, we present a copy of the original and of the re-issued patents. The part without the brackets and not in *italics*, is what appears in both, the part within the brackets, shows what is in the original which is not in the re-issue and the part in *italics*, shows, what is in the re-issue and not in the original.

"Be it known that I, William Campbell, of the City, County, and State of New York, have invented a new and useful improvement in Window Shade Fixtures; and I do declare that the following is a full, clear, and [exact] *concise* description of the same, [which will enable others skilled in the art to make and use my invention,] reference being had to the accompanying drawings, [which form] *making a* part of this specification. [in which]

This invention is an improvement in that class of shade-fixtures in which the shade-roller is provided with a spiral spring for the purpose of automatically winding up the shade, and relates to an improved device or arrangement of parts by means of which such spring-roller, and the shade attached thereto, may be arrested and held stationary at any desired point of elevation within the range of its movement, and at the same time allow the shade to be drawn or run up as far as may be desired without obstruction or stoppage, and by means of which also the tension of the spring will be preserved, or the spring be prevented from uncoiling when the roller is removed from the brackets, the same as when resting therein.

In such fixtures, as generally heretofore constructed, when the shade-roller is removed from the brackets the spring in the roller unwinds, which renders it necessary to again wind up such spring before placing the roller *in its brackets, and this is not easy for an ordinary or unskilled person to do; and it consists in the combination, with a flattened or notched shaft or spindle of the roller, which acts as a ratchet, of loose or sliding pins or bolts acting as pawls or detents, and which by their contact with such flattened or notched shaft or spindle, arrests and holds stationary the roller and its shade at any point desired, and in arranging such pins or detents on the roller having such a flattened or notched spindle, so that there will be no disconnection of the detent and ratchet when the roller is removed from its brackets, which prevents the spring from unwinding.*

Figure 1 is a front view of [my improved window shade, part being broken away to show the construction.] *a roller, with shade attached, containing my improvement.*

Figure 2 is a detailed sectional view, *enlarged* of the same [taken] through the line x x Fig. 1. [My invention has for its object to furnish an improved device, by means of which the spring roller of a window shade may be made to hold the shade stationary at any desired elevation, and yet allow the shade to be drawn down or run up, without obstruction or stoppage, as far as may be desired, and it consists in the combination of the loose or sliding pins or bolts, having heads formed on them, with the flattened shaft of the roller as herein more fully described.]

Fig. 3 is an enlarged view of one end of Fig. 1, a part being broken away to show the position of the operative parts.

A is the window shade, B is the hollow roller, *in* one end of which is [pivoted to] *fixed a pivot or spindle, a, turning with the roller, and which rests and turns in* the bracket C, and the other end of [which] *such roller* revolves upon the shaft *or spindle* D, [that carries the coiled spring, and] the projecting end of which *does not turn with the roller but* is *held or* secured in the jaws of the bracket E. *one* end of the spiral spring, within the *roller B, is secured to the spindle D, and the other end to the roller B,* so that, [by drawing down] *as* the shade A [and thus revolving] *is drawn down and* the roller *revolved,* the [coiled] spring [may] *will* be wound *up or* closer around the shaft D, *and thus have when not restrained, a tendency to roll up the shade.* In the block or *cap* part *b*, *that forms the end* of the roller B [that closes or forms the end of the said hollow roller B,] and forms its bearing upon the shaft *or* spindle D, *and about which it revolves* are [formed] two holes, *or cavities I. I.* [leading] upon opposite sides, *extending* from its outer [or convex] surface to (a little at one side of its center) *to the shaft or spindle D* as shown in Fig. 2. The outer ends of (these holes,) *which cavities may be* (are) countersunk, as shown.

The (two) opposite sides of the shaft *or spindle* D, within the block or *cap* part b *of the roller*, are flattened or notched, as shown, *to take the pins or bolts moving in the cavities I*, F F are two pins or bolts, *or detents*, the bodies of which fit, *loosely* (into) *in* the holes (I I) in the block *or* cap b and (there) *the* heads of *which* fit *loosely* (into) *in* the countersunk parts of (said) *such* holes. (The bolts or pins F are of such a length) *the length of such bolts or detents being such* that when their heads (rest) *are* against the case or shell *e* of the roller (B), their points *or lower ends will* (may) be free from *or not be in contact with*, the shaft *or spindle* D, (and) *but* when *such bolts drop, so that* their heads rest upon the bottom of the countersunk part of (said) *such* holes, their (inner ends or) points *or lower ends* (may overlap) *will be in contact with* the flattened *or notched* sides of the *spindle or* shaft D, so as to bind (said shaft) *against such spindle* and prevent (its) *the* revolution *of the roller*. Whenever the (shaft D) *shade A* is drawn down or *is* allowed to run up with a (little rapidity) *quick movement*, the centrifugal force (engendered) *produced* by the revolution of the roller B, projects the pins (F) outwards, so that (their head) *they are carried away from the spindle D and* against the case or shell *e* of the roller, (B, leaving the block b free) *thus permitting* the *roller* to revolve *freely* upon the shaft *or spindle* D. But when the (motion) *shade and the revolution* of the roller (B) is checked, the (pin) *bolt or detent* F (that) *which* happens to be uppermost drops down, (so that its point or forward end rests upon the shaft D, and as soon as said point reaches) *upon and against* the flattened *or notched* side of (said shaft) *the spindle* D, (it drops down a little further, so as to overlap the said flattened side of the shaft) *and arrest the further revolution of the roller* and holds it securely in place.

As these pins or detents are placed in a recess upon the roller, of which *the spindle which forms the ratchet is also a part, they are equally effective to hold the roller from turning, whether the roller remains in or is removed from the brackets, and therefore the spring is prevented from unwinding when the roller is taken out of its brackets.*

The pins or detents F F are loose or sliding, as contradistinguished from such as are hinged or pivoted, and are kept in position so as to engage with the ratchet or notched spindle by the chamber or guide in which they move.

(Having thus described my invention, I claim) *what is claimed* as new *is* (and desire to secure by letters patent.—)

1. *In a spring shade roller, having a pawl or detent and a ratchet, or their equivalent, so arranged as to allow the shade to be drawn down or run up without obstruction, and which engage automatically with each other to hold the shade in any desired position, the arrangement of such pawl or detent on the roller which carries the notched spindle or ratchet, so that when the roller is removed from its brackets the tension of the spring will be preserved.*

2. *In a spring shade roller, having a detent and ratchet, or their equivalent, constructed and arranged to engage automatically with each other for holding the shade, the combination, with the ratchet, or its equivalent, of a loose pawl or detent, moving in a chamber or guide, and adapted to engage with the spindle.*

3. The combination of the loose or sliding pins or [bolts] *detents* F. [having heads formed upon them], *constructed as described*, with the flattened or notched shaft *or spindle* [D] substantially as herein shown and described, [and for the purposes set forth.

The above specification of my invention signed by me this 14th day of August 1867.]

By the above comparison it is apparent that every word which relates to the function of preventing the spring from unwinding when the roller is removed from its brackets is found in italics, and that it is new matter.

That the complainant and his experts consider this first claim as broader than the claim of the original is shown by the fact that although the third claim of the re-issued patent is in substance, and almost in words, the same as the only claim of the original, they do not claim that we infringe this third claim. Therefore, they do not claim that we infringed the original and if we do not infringe the original we do not infringe the re-issue, for if the re-issue is for the same thing as the original we do not infringe it, and if it is for something else than the original the re-issue is void.

Newton vs. First & Bradley Manfg. Co., 14 Fed. Rep. 465 (470).
Commeyer vs. Newton, 16 Off. Gaz. 720.
Seymour vs. Osborne, 3 Fish. 555.

The complainant's counsel in asking the witness whether the Campbell re-issue is different from the original, frames his question in this way, page 66 of record "23 Q. Please examine the Campbell re-issue, 7,367, and the original thereof, 69,176, and state whether you find in the former any different inventions described from that which is shown and described in the latter."

The answer, of course, is that he does not.

But the counsel is very careful not to ask if the expert finds any thing claimed in the re-issue which is not claimed in the original.

When the witness Renwick was asked [page 76. of record 65 Q.] whether the first claim in the re-issue was broader than the original, he says that it would depend upon the construction put upon the claim of the original. And in the answer to 66 x Q. at the end he says, "As the claim is in substance, to a structure made and operating substantially as described in the patent, the claim covers a structure in which the spring will be locked when the roller, as a whole, is removed from the brackets," and in the beginning of this answer, he says "that the original patent does not say that the spring will be locked when the roller is removed from its brackets."

Therefore if the first claim of the re-issue will cover a roller in which the spring is locked when the roller is removed from its brackets, the claim is for something not described or claimed in the original.

It is true that the device described in the original would lock the spring so that the roller could be taken from its brackets without allowing the spring to unwind, but then the patentee and more particularly his assignee, the complainant in this case, has lost the right to claim this function, claimed in his first claim—by his laches.

Miller vs. Brass Co., 104 U. S. R. 160.
Bantz vs. Frantz, 105 U. S. R. 106.
Mahn vs. Harwood, 112 U. S. 354.

The complainant in this case, as it appears by the record, has been engaged in the manufacture of shade rollers for many years, and made an invention and procured a patent therefor which claimed this very function. The claim of his patent, No. 68,502, dated September 3, 1867, is as follows:

"The attaching a pawl or ratchet, or notched hub, to a window shade roller provided with a spring, or two parts connected with said roller, in such a manner that the tension of the spring will, without any manipulation or adjustment of parts whatever, always be preserved, whether the roller be fitted in the brackets or bearings or removed therefrom, substantially as set forth."

When he re-issued his patent he disclaimed this claim because Campbell had made the invention first. The complainant purchased the Campbell patent and had it re-issued, but that will not excuse the laches of Campbell for five years after he obtained his patent. Indeed it is not evident that Campbell would have, of his own accord, ever re-issued his patent.

Hartshorn says he first learned of the Campbell patent in 1873 and then that he bought it and had it re-issued.

In the record of what is called the Harris suit introduced in evidence by the complainant, on page 167 of record will be found part of the deposition of William Campbell in which he was asked (crossint., 25). "Why did you not claim placing the pawl upon the roller so that it would revolve with it?" and he answered, "Because I didn't think it amounted to anything."

Nor did he think of setting up a claim for the function of locking the spring so it would not unwind when removed from the brackets. This was the claim in the Hartshorn patent, and after Hartshorn found that Campbell had made the invention first, although not claimed, Hartshorn bought the Campbell patent and re-issued it with this new claim.

This re-issue of the Campbell patent was for the benefit of the assignee, the claim is now made that this re-issue should be sustained for the benefit of the assignee, although it is admitted that Campbell had lost his right to a re-issue through his laches, that the assignee has a better claim to the re-issue than his assignor.

And to support this claim it is argued that Hartshorn, the assignee, had claimed as his own invention, in a patent issued to himself prior to Campbell's, the invention which was really Campbell's. He (Hartshorn) having purchased the Campbell patent was entitled to re-issue it, or to swap the claims, because no other inventor had described and claimed the device claimed in the Campbell re-issue, during the interval between the issue of the two patents, and that therefore the public had not been injured by such re-issue.

That a monopoly based on an invalid patent, could change its base of support, and by purchase of another invalid patent, have the same re-issued so as to become a good and valid patent and a firm and lawful foundation for the monopoly is a proposition which carries with it, its own refutation that the assignee, because he had perpetrated, undesignedly perhaps, a fraud on the public has the right to perpetuate this fraud by the re-issue of a patent, as assignee, of a patent which had lost the right to a re-issue through the laches or indifference of the patentee, could only be concieved in the brain of a keen citizen of the city of New York.

But the public have been injured by this re-issue of the Campbell patent, the law provides that an inventor shall have a patent for seventeen years, that he shall have the exclusive right and privilege to make, use and vend the invention claimed in his patent during this time.

Now let us look at the position of Hartshorn as stated by himself. I obtained a patent with a claim that proved to be invalid, this patent was dated September 3rd, 1867, and I enjoyed the monopoly of making, using and vending from the date of this patent until I discovered that I was not the first inventor, but that Campbell who had a subsequent patent, was the first inventor and that the claim in my patent was therefore invalid. Campbell's patent was re-issued on the 24th, of September, 1867. I bought it and had it re-issued to claim the same invention of which I had been enjoying the monopoly since the third of September, 1867, my patent expires on the 3rd, of September, 1884, but Campbell's will run until the 24th, of September, 1884, thus my monopoly will be extended twenty-one days.

That this extension of the duration of a monopoly was a fraud upon the law and the public, is to clear for a doubt. If it could be thus extended even for one day it might purchance be extended for years on the mere assertion or even proof that somebody else was the first inventor though his patent was long subsequent to the first.

The third patent involved in this suit is the Hartshorn re-issue, No. 7,370, dated October 31, 1876, of his original patent, No. 68,502, dated September 3, 1867.

One of the defenses set up by the defendants to this patent is that it is not for the same invention as the original.

For the purpose of showing the interpolations to the original we present the following in which the parts without the brackets and not in *italics* are common to both, the parts included in brackets is what appears in the original and not in the re-issue, and the parts in *italics* is what is inserted in the re-issue which is not found in the original.

Be it known that I, Stewart Hartshorn, of the city, county, and state of New York, have invented a new and improved shade fixture, and I do hereby declare that the following is a full, clear and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings forming part of this specification.

This invention relates to a new and useful improvement in that class of shade fixtures in which the roller is provided with a spiral spring for automatically winding up the shade. The present invention is an improvement on a shade fixture of this class for which Letters Patent were granted to me, bearing date October 11, 1864, (and is designed to obviate an objection attending the original device, which consists in the unwinding of the spring) *and re-issued August* 27, 1867, *in which the pawl and ratchet or notched hub designed and used to arrest the rotation of and hold the roller were arranged to act automatically, and in such a maner that the shade could be stopped and retained at any desired position within the scope of its movement, by simply manipulating the shade and varying the speed of the rotation of the roller, and thereby dispensing with the use of side cords or counterpoises. As described and illustrated in such patent, the notched hub was attached to or made a part of the roller while the pawl was fixed to one of the brackets which supported the rollers. In such arrangement, also of these parts,* when [ever] the [shade] roller is removed from its brackets [or bearings, a contingency which involves the necessity of winding up the spring] *the pawl and notched hub are disconnected and the spring unwinds, which has again to be wound up*, previous to [the] replacing [of] the roller in its bearings.

In the present invention the pawl is hinged or pivoted as in the said patent referred to; but such pawl is placed on the end of the roller, or a part fixed thereto; and revolves with it, and the notched hub or ratchet is placed upon the spindle or stationary part of the fixture, such arrangement of parts also permits the roller to be taken from its brackets without the spring unwinding.

In the accompanying sheet of drawings, Figure 1 is a longitudinal central section of a *roller employing* my invention, taken in the line x x, Fig, 2; Fig. 2 a transverse section of the same, taken in the line y. y. Fig. 1 *and Fig.* 3 *is an end view of such roller showing the flattened end of the spindle, and in dotted lines the position of the pawl and notched hub.*

Similar letters of reference indicate corresponding parts.

A represents a window shade, and B the roller to which it is attached, the roller having a spiral *or other* spring C fitted within it, and arranged in such a manner that it will have, when not restrained, a tendency to roll up the shade.

The spring attachment *to the roller* is the same as shown and described in my original Letters Patent.

The roller B is provided with journals a a^1, to one of which, *a, sometimes called a spindle* a hub, D, is keyed, said hub having a notch, *b*, made in it, as shown clearly in Fig. 2. The journal *or spindle* a of the roller [has a] *is* square or *has* two flat sides at its outer end, as shown [at b,] *by dotted lines in Fig.* 2 to fit into a bracket, E, attached to the window frame, and this journal *a* does not turn with the roller, but the other journal, a^1, is fitted firmly in a head, *c*, in the roller, *and turns with it, and to such* [to which] head the case of the roller [a metalic hub d,] is attached, the journal *or spindle a* or an extension a^1 thereof, being fitted loosely in the head *c*, so that the roller may turn without the journal *a*, as will be fully understood by reference to Fig. 1.

The end of the case or hub *d* of the roller has a disk *c*, *Fig.* 2 *and* 3 secured to it, and this disk, as the roller *B* rotates, turns *with it and* loosely on the fixed journal *a*.

This disk *e* has a pawl, *or detent*, F attached to its inner side, *as* shown more particularly in [Fig. 2.] *Figs.* 2 *and* 3, and [this] such pawl, *or detent*, when engaged with the notch *b* in the hub D, retains or holds the roller B, so that it cannot turn under the influence of the spring C, and roll up the shade A. *Such pawl or detent F is pivoted or hinged to the disk e and acts substantially at right angles to the notched hub or spindle a b.* The spring when fitted in the case *d*, is attached, *at* one end to the head *c*, and by the other end the fixed journal *a or spindle a*, or its extension a^X, and the spring is wound up by pulling down the shade B; consequently, when the shade is fully down the spring will have a tendency to wind it up.

The pawl *or detent* F engages itself with and disengages itself from the notched hub D automatically.

In the construction shown in the drawing in order to insure the pawl engaging (itself) with the hub, the (upward) motion of the shade is *simply* checked; for, by having the *roller A and its* disk e rotate slowly, the pawl will drop into the notch b (of the hub) but when *such roller and* (the said) disk (is) *are* allowed to rotate rather quickly, the pawl *or detent* will (pass over the notch b) not (having time to) drop into (it) *such notch at its loose end will be carried by the revolution of the roller towards the periphery, or away from the ratchet hub; but, by changing or checking the* *revolution of the roller the pawl will at once automatically drop unto the notch and arrest the roller and shade.* Hence the shade may be retained at any desired height without any difficulty whatever [precisely as in the original invention previously patented], *as in the roller described in the previous patent, by merely varying or changing, through the simple manipulation of the shade, the speed of the rotation of the roller and the consiquent movement of the shade.*

[The difference however between the within prescribed arrangement and that of the original invention is essential. In the original plan the spring C unwinds immediately as soon as the roller is removed from its bracket or bearings, as the pawl, instead of being attached to the roller or any part connected therewith, is attached to the bracket, the notched hub being attached to the journal of the roller, and when the notched hub is removed from the pawl the spring immediately unwinds.

In my present improvement the pawl and notched hub being both connected with the roller the spring is retained or prevented from unwinding equally as well when the roller is removed from its brackets or bearings as when adjusted in them.]

The pawl or detent K is a hinged or pivoted pawl as distinguished from a loose pawl moving in a chamber or guide of some form to keep it in position.

I do not claim, generally, the arrangement of both the pawl and ratchet upon or in connection with the roller, so that the roller can be removed from its brackets without permitting the spring to unwind, as I believe such an arrangement of pawl or detent and ratchet, as shown in the patent of William Campbell, granted to him September 24, 1867, *had been known previous to being made by myself,*

[Having thus described my invention] what [I claim] *is claimed* as new, [and desire to secure by Letters Patent,] is.

[The attaching of a pawl and a ratchet, or notched hub, to a window shade roller provided with a spring, or two parts connected with said roller, in such manner that the tension of the spring will without any manipulation or adjustment of parts whatever, always be preserved, whether the roller be fitted in its brackets or bearings or removed therefrom substantially as set forth.]

In a spring shade roller having a pawl or detent and ratchet, or their equivalent, constructed and arranged so as to engage automatically for holding the shade at any desired point or height, the combination, with a spindle or stationary part of the fixture, of a hinged or pivoted pawl, placed upon the end of the roller, and acting substantially at right angles to the ratchet or notched hub.

The above comparison of the two patents shows that the general claim of the original is entirely abandoned and a totally different invention claimed. It will be said that the claim is lessened, and that the patentee is entitled to this claim, in the re-issue, but to enable the patentee to make this claim his specification had to be re-written and new matter inserted, and we contend that this amendment and alteration of claims comes under the decision in *Miller vs. Brass Co.*, 104,U. S. R. 350

Having made a broad claim in his original patent for the means to perform a certain function can he be permited at this time to make the change, to set up a claim for the specific means he shows in his patent. His original patent was anticipated and consequently he re-issued his patent—to claim his specific form—but, his specific form had been on the market for more than two years before he re-issued his patent and therefore he could not claim an individual property in this device, having voluntarily put it upon sale under the broad claim of his original patent which was not limited to any particular form or means.

If the Campbell invention anticipated the original as is admitted in the disclaimer inserted in this re-issued patent of Hartshorn's why does it not anticipate this re-issue as well?

The complainant's witnesses admit that the Hartshorn patent is subordinate to the Campbell, and if it is, wherein is there any invention in the Hartshorn re-issue?

We deny that there was any invention in substituting the hinged pawl of Hartshorn's first patent for the sliding bolts of the Campbell.

Neither of these two pawls was new with their inventors; they had both been used for years and either was used where ever it was needed, according to the convenience of the user. The record of this case shows that the hinged pawl and notched hub or ratchet had been used in window shades before Campbell made his invention, but not in the same arrangement, but having been used in window shade roller fixtures, where was there any invention in Hartshorn's substituting for the sliding bolts of Campbell the old and well known hinged pawl? That it acts at right angles to the notched shaft is no invention, because the sliding bolts or pins of Campbell's act also at right angles with the shaft or spindle, or notched hub. So the pawl acts in the Smith English patent. So that all that Hartshorn has done, according to his own admission in his disclaimer and the testimony of his own witnesses, is substituting the hinged pawl and ratchet or notched hub for Campbell's sliding bolts, and flattened or notched shaft—and there is no invention in substituting one well known pawl for another as well known.

Therefore, we submit, may it please your Honor, that these three patents are invalid.

The David patent because it claims only an aggregation of elements which perform no function, and are of themselves inoperative.

The first claim in the Campbell re-issue because it is not for the same invention described and claimed in the original, and the right to a re-issue has been lost by laches.

The Hartshorn because, 1st, It is not for the same invention claimed in the original. 2d, It is by the admission in the disclaimer anticipated by the Campbell. 3d, It is to late for Hartshorn to make this claim, for he has lost his right to a re-issue by his own laches.

The defendants set forth in their answer that the various patents in this suit were in all substantial parts anticipated by the Smith English patent of 1848, the Davies English patent of 1854 and by the Hartshorn patent of 1864.

Without following the words of the patent we find that Smith shows:

A roller with a pivot, upon which it turns, fixed in one end of the roller, The roller is hollow at the other end and has attached to it at the bottom of the hollow a torsional spring which is fastened at its other end to a shaft which passes through a cap on the end of the roller, and this shaft has a square end which is inserted in the square hole in the bracket which prevents this shaft from rotating, whereby the spring is twisted as the curtain is unrolled. The spring being twisted somewhat at all times, so that the power of the spring was always in operation, was still further twisted as the curtain unrolled and the force increased. The cap on the end of the roller carried the ratchet, and the box which covered the cap carried the pawl which engaged with the ratchet and controlled the action of the roller. This box was prevented from turning by the square part of the shaft which passed through a square hole in the box. This brings the roller, the ratchet and the pawl all on the shaft.

This is what Campbell and Hartshorn do in the patents in suit.

The result of this arrangement of Smith's is that the roller may be removed from its bracket and the pawl and ratchet hold the shaft from turning under the power of the spring and so the spring cannot unwind, which is the office or result claimed as the effect of the device claimed in the first claim of the Campbell patent.

The first claim of the Campbell patent is claimed by the complainant's witness to be limited to such an arangement as would allow the shade to be drawn down and run up without obstruction. There is no doubt that the curtain in the Smith patent can be run down without obstruction, but the complainant insists that it cannot be run up without somebody or something to hold the pawl up from the ratchet. The defendants had a roller made which they claim is a fair representation of the Smith patent, which will run down and up without obstruction. The complainants were not contented with this exhibit and proceeded to have what their witness calls Chinese copy, forgetting that "no patentee is held, in reducing his patent to application, to strictly and entirely follow the mere mechanical device shown in his drawings of the patent. He may deviate so long as he does not violate the principle involved." *Weir vs. North Chicago Rolling Mills Company*, XIV Fed. Rep. 42.

But their Chinese copy will wind up the curtain as quick as our model when the pawl is placed on the top of the ratchet, as it is in Hartshorn's re-issue, when it is out of the notch in the ratchet wheel, this winding up of the curtain is done although all weight is taken off of the trigger of the pawl in the Smith patent which the complainant's experts both say cannot be done, but a simple experiment will show how quick this curtain in complianant's model will wind up when the weight is taken off the trigger and the pawl is placed on the top of the ratchet tooth [i. e., entirely out of the ratchet] and the curtain released from the hand.

The complainant's experts reiterate their assertion that this will not thus roll up and insist upon it that the curtain will not roll up under these conditions. If they are mistaken in this in how many other things are they mistaken? They deride the assertion of Dr. Hagan, that, the curtain in the Smith patent will so roll up, but he is right and they are wrong, and they are just as wrong every time they contradict him.

The pawl in the Smith English patent is a hinged or pivoted pawl; it acts at right angles with the ratchet or notched hub—but it is not, on the roller—but in the box on the shaft and the ratchet is on the roller, was there any invention in changing the ratchet to the fixed shaft from the roller and then putting the pawl on the roller when no new effect was produced by so doing?

This Smith English patent would answer the first claim of the re-issued Campbell patent, as well as the Campbell device. It differs from the Campbell re-issue in having the pawl on the shaft and the ratchet on the roller, instead of having the ratchet or notched hub on the shaft and the pawl on the roller. The whole is contained within the box and on the shaft entirely independent of the bracket, and always attached to the roller, in fact forming an integral part of it. When the ratchet by the rotation of the roller brings one of its teeth under the pawl the pawl drops into the tooth and the roller is arrested in its movement. The action of the Campbell device is that as the roller revolves the pawl is brought over the notch or tooth in the ratchet, the pawl drops in the tooth or notch, and the roller is arrested in its movements.

This interchange between the pawl and ratchet in Campbell's device from their position in the Smith patent did not require invention. It did not produce any new result.

The tooth or notch of the ratchet must be in both cases under the pawl or it will not engage with the pawl; then in both the movement of the roller is arrested by this means; both can be taken from the bracket without allowing the spring to unwind; both permit the curtain to be drawn down without obstruction; both permit the curtain to be rolled up without obstruction. The ease of manipulation depends upon the number of teeth in the ratchet, the Campbell device has two while the Smith has five. The form of the ratchet teeth in the Smith patent is the most unfavorable for the easy working of the curtain that could be devised, being sharp pointed with the face of the tooth perpendicular when in contact with the pawl, with a sharp point and thence on the back falling down to the lowest point, while on the Campbell patent the flattened sides or notched hub take up only the two opposite quarters of the circumference of the shaft while the pawl rides on the parts not flattened, and the roller actuated by the coiled spring, if allowed to move the pawl quickly over this non-flattened part, gains velocity enough to carry the pawl beyond the flattened side or notch in the hub, and so the curtain can be rolled up as far as desired; then by causing the curtain to wind up slowly the pawl will drop into the notch of the ratchet and the movement cease. In the Smith, when the pawl is on the top of the point of the ratchet tooth it is in the same position as the pawl in the Campbell, when on the non-flattened side of the shaft, and if the curtain is released from the hand it will instantly wind up, and it will, in all events, wind up until checked, and all this is done without the use of the cord and tassel, with its weight, so much insisted upon by the complainants' experts as a necessary part of the Smith invention.

If the teeth of the ratchet in the Smith were as few and formed in like manner so that the alternate quarters of the circumference of the ratchet wheel were entire and without teeth, then it would operate in all respects like the Campbell re-issue: if there was but one tooth in the ratchet, as in the Hartshorn, then the Smith would in all respects act as the Hartshorn.

From the above it is evident that the decreasing the number of teeth and the changing the form of the ratchet has more to do with the ease of the manipulation of the curtain, than any other change from the Smith patent.

There is no invention in the lessening the number of the teeth of a ratchet wheel, for ratchet wheels with any number of teeth have been in use from time immemorable; but there is no claim made for the form or number of the teeth of the ratchet or notched hub, nor form of the pawl, either in the Campbell or Hartshorn patents.

Thus the Smith English Patent anticipates the first claim of the Campbell patent and the Hartshorn, and the Campbell anticipates the Hartshorn.

As to the infrigement by the defendants of any of the patents, or rather claims of these patents in suit, the evidence of Dr. Hagan shows that the defendants do not use any device in the complainants' patent which is not anticipated in the prior patents offered in evidence.

Dr. Hagan's evidence in regard to the use, by defendant's of the devices claimed by the complainant, in these various patents, is as follows, commencing at q. 27, page 111, record.

"Q. 27. Will you examine complainants' exhibit, Saginaw Barrel Company's roller, No. 2. and state, in view of the state of the art, as appearing in the English Smith Patent, English Davis patent, and the first Hartshorn patent of 1864, and the Campbell patent No. 69,176, whether we make a device which is covered by any claim in said re-issue patent No. 7,370, which is not shown in some of the patents above recited?

Ans. In view of the state of the art as shown and exemplified in the record, and as shown in the older patents named in the question, and to which I have referred in my former testimony, the field in which invention could move in the use of a pawl and ratcheted hub to regulate the torsional resistance of a spring placed within the roller to work the latter would be necessarily limited to the specific construction employed, from the fact that these same elements themselves had all been used before to accomplish the same result. I do not think myself, in view of these older patents named, that there is any invention in the subject matter of the claim attached to the patent re-issue 7,370, and I am of the opinion that the defendant's roller named in the question is made with as much of an advance upon the existing state of the art at the time the re-issue 7,370, was granted, and even more than the latter did (the re-issue) upon the prior state of the art preceding it;—

(All that part of the words after 7,370 objected to as not called for in the question.)

And it is upon these differences that I base the opinion which I give. The device shown in the Hartshorn re-issue 7,370 shows the stationary hub notched at the top, and so combined that the pawl with the latter could in no way engage with the stationary hub excepting when the roller made a complete revolution; there was no arrangement by which the revolution of the roller could be arrested or detained, except upon the top of the stationary hub; the defendants' device on the contrary, is so constructed that a pawl may engage with the hub at from 6 to 8 points in one revolution of the roller, and consequently the rotation of the roller can be checked at shorter intervals than it can with the other, (the complainant's device), which, as I have before stated, necessitates a complete revolution of the roller and the unrolling of the curtain to that extent.

In the Hartshorn device the pawl is attached to and constructed in form so as to co-incide circumferentially with and ride over the surface of the stationary hub, the pivotal end of the pawl in this device being placed near to the hub upon the disc, while in the defendant's device it is attached as near the perimeter of the disc as is possible, and away from the hub, so that it will engage with the latter at any point in which one of the openings of the ratcheted hub will engage with the pawl; thus the roller can be rotated and checked at a quarter or half of a revolution, which cannot be done by the other, (the Hartshorn) device as the hub is constructed and the pawl located. The defendant's device makes a nearer approach to the English Smith patent as regards the connection between the pawl and the ratcheted hub, than it does to that showing the Hartshorn re-issue 7,370, with the exception that the defendants use a stationary hub and put the pawl upon the disc at the end of the roller instead of on the roller cap of the English patent. The defendant's device and the complainant's device both use a pawl attached to the roller disc and a stationary hub; in this respect they resemble each other, but the pawl and hub of the defendant's device are constructed to engage in a different manner, as I have before stated.

Q. 28. Will you examine complainant's exhibit, Saginaw Barrel

Company's roller No. 2. and state in view of the state of art as appearing in the English Smith patent, English Davis patent, and the first Hartshorn patent of 1864, whether we make a device which is covered by the first claim of the Campbell re-issue patent No. 7,367, which is not shown in some of the patents above cited, and give your reasons for such opinion.

Ans. In my opinion the defendants' device does not contain the invention described in the re-issue 7,367, as named in the first claim of said re-issue. As I have before stated on this examination, the said re-issue 7,367 shows a means of operating the torsion spring of a curtain roller by means of pins working in holes so as to engage with the flattened side of a shaft D, and that these could not in any sense be reasonably interpreted to mean pawls; I do not find any such pin in the defendants, device and that one named in the question. It is true this re-issue terms these pins, pawls, but even if they are pawls they are not pivoted to the perimeter of the roller disc and do not drop into the holes or notches formed in the hub, from their pivoted connection and having a hooked end.

Q. 29. The same question is repeated as to the Jacob David patent?

Ans. As I have before stated on my examination, the David patent illustrates and describes a latch arranged upon a curtain roller so as to move with it and to slip over or engage with slot formed in the bracket which receives the stationary end of the roller, so as to check or arrest the force of the spring in rolling up the curtain. This device of necessity makes the bracket a part of the fixture to operate it, and in this respect is widely different from defendants' device, the only function of the bracket in the latter being to receive and sustain in position the stationary part of the roller to which the torsional spring attaches. There is not any resemblance whatever between the means employed to regulate or arrest the torsional force of the spring, as shown in the David patent, when it is compared with the defendants' device, with the exception that both serve as detents, that in the David patent being a latch and bracket catch and that in the defendants a pivoted hooked pawl and a ratcheted hub.

Q. 30. I find in the first claim of this David patent the following: "The arm or detent K, arranged upon the roller in such a manner that it moves towards and away from the center or axis of the roller *a*, by the action of gravity and centrifugal force;" will you give your opinion as to the meaning of that claim?

Ans. I assume it to mean that when the roller is moved rapidly the latch K is thrown outward by the rapid motion of the roller so as not to engage with the latch formed in the bracket, but that when moved slowly gravity would cause it to drop into the bracket catch; but the language of the claim is rather ambiguous, and the fact that it states that it moves towards and away from the center or axis of the roller *a*, by the action of gravity and centrifugal force, from which one would infer that gravity or centrifugal force, either one of them, performed one or both offices of moving it towards or away; but I think as modified by the words, substantially as described, it would be as I have stated; as a fact, whether this is so or not, and the velocity at which the curtain can be moved is sufficient to throw out this latch by centrifugal force, I very much doubt. I have no doubt however, that it does jump over the catch and move rapidly so as not to engage with it."

This evidence of Dr. Hagan shows the narrow extent of the claims, even if they are held to be valid, and that the defendants do not make or use any device claimed in these patents which is not shown in curtain fixtures prior to these patents. The defendants are using an improvement in window shade fixtures which they had the same right to make as Campbell, Hartshorn or David had.

MAY IT PLEASE YOUR HONORS:

We have shown, we think, that the claims of the David patent involved in this suit are frivolous; that without the addition of something outside of the claims themselves, the devices and aggregations produce no result in and of themselves.

That the David patent is not the first where these devices were used in shade rollers, and that therefore he is confined strictly to his own specific construction as described in his patent.

That the defendants do not use the specific device shown in the David patent, and therefore do not infringe this patent.

That the defendants are charged with infringing the first claim of the re-issued Campbell patent, and that only.

That the subject matter of the first claim of the Campbell re-issue is entirely new matter both in the specification and in the claim.

And therefore it is void.

That the function of the device of the first claim of the Campbell, was first appreciated by Hartshorne, the assignee of Campbell, and not by Campbell, and that if the claim was valid in other respects, the right to re-issue was lost through the laches of the inventor.

That the same function is performed in the Smith English patent of 1848 in substantially the same way and by the same means, only under a different arrangement of the elements, not involving invention on the part of Campbell; and therefore the first claim of the Campbell invention is anticipated by the Smith English patent of 1848.

Marsh vs. Dodge & Stevenson Manf Co.,
6 Fish., 562 (565 and 566.)

Therefore we submit that the first claim of the Campbell re-issue should be held to be invalid.

That if this first claim should be held to be valid, it should be confined strictly to the devices shown and described in the specifications, as the same function is performed by the Smith English patent of 1848, and apparently in the Davies English patent of 1854.

When so construed the defendants do not infringe this first claim.

That the original claim of the Hartshorne patent in suit, was for any device which would permit the roller to be removed from its bracket, and retain the tension of the spring.

That the invention claimed in the re-issue, is for the combination of the spindle or stationary part with a hinged or pivoted pawl on the roller, acting at right angles with the notched hub.

We maintain that this is entirely new matter both in the specification and the claim, and is therefore invalid.

That this claim is not a lessening of the former claim, but a claim for an entirely new device, because the description is entirely new matter, which is not contained in the old patent.

That this is substantially anticipated by the Smith English patent of 1848. By the Davies English patent of 1854, and by the Campbell patent in suit.

That there is no invention in interchanging the position of the pawl and ratchet of the Smith English patent of 1848, or in substituting a hinged pawl for the pins of Campbell, the hinged pawl being shown in the Smith English patent of 1848, and in the first patent of Hartshorne of 1864, all acting at right angles with the ratchet or notched hub.

That if this claim is valid in other respects, the complainant lost his right to it by his own laches, as it appears on the face of the specification that this patent was re-issued in 1873, and that the present re-issue was granted in October 31, 1876, nine years after the date of the original.

That the defendants do not infringe this claim, when interpreted by the light of former patents,

Therefore may it please your Honor, we submit that this Bill should be dismissed as to all these patents.

SPRAGUE & HUNT,

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Chas. J. Hunt
of Counsel